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SOME GERMAN IDEAS ON CAVALRY GATHERED FROM "CONVERSATIONS ON CAVALRY."—PRINCE KRAFT DE HOHENLOHE-INGELFINGEN.

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THE author of "Conversations on Cavalry," Prince KRAFT DE HOHENLOHE-INGELFINGEN, General of Infantry and aide de camp on the staff of the Emperor of Germany, had previously published, among other works, "Letters on Cavalry," in which he had warmly praised the mounted arm for its services in the Franco-Prussian war.

These "Letters" gave rise to a number of conversations between himself and a cavalry officer, whom he describes as "of the highest rank, and of the greatest experience, both in war and in the instruction of troops in time of peace."

These conversations the author has faithfully recorded, with the dates on which they occurred, extending from November 1885 to June 1886.

Although the form is that of a discussion, the author does not combat any of the propositions of his cavalry friend, and the conversation may be taken as an exposition of the ideas of the latter. The style of this work, of some four hundred pages, is necessarily prolix, and, while we may regret to find the material in such a shape, we must take it as an evidence of the intense interest in the preparation for war, that such a

work should not only be brought out but should find immediate translation into French — for it is from the French version that I make my notes.

The cavalryman, while heartily thanking the Prince for having undertaken the defence of the mounted arm against the attacks that have latterly been made upon it, thinks that his praise has been too generously bestowed, and assures him that this opinion is shared, generally, by the experienced officers of the arm.

"You have represented us as realizing the ideal," he says, "while we feel, even in reading your writings, how little we made of our opportunities and how vast is the room for improvement."

"You consider praise, properly bestowed, as more likely to stimulate improvement than would hostile criticism, which more often provokes useless discussion and resistance; but your dominant idea is, that our cavalry was employed according to the rules in '70 and '71; that, generally, it was well led and behaved handsomely; that its services were highly satisfactory."

"True, the Uhlan was the terror of all France, but, as the French cavalry was still more badly handled than our own, this is saying little."

"How often our cavalry disappointed our expectations. A SEYDLITZ would have given a better account of them. Such a genius cannot, indeed, be made to order, but the system of education should result in forming chiefs capable of properly handling masses, capable of doing great deeds with them; and it should result in forming these chiefs from men only fairly gifted, if they are but vigorous, active, brave and chivalrous."

"Our cavalry is animated by the best spirit, its officers yield nothing in zeal and devotion to those of FREDERICK THE GREAT; its horses are even better; but what is the use of all this, if the horses are not trained and handled in a rational manner."

"Our horses are tough and capable of extraordinary service when rationally handled. For example:—

"A brigade marched one day from Beauvais to Gisors, took part in the capture of that place and returned to Beauvais in the afternoon, 38 miles; the next day it moved to Gournay and back, 31 miles; the fourth day it moved to Bretevil, where some squadrons made several charges, and it then returned to Beauvais in the afternoon, 38 miles."

"But how seldom we dared to demand such efforts. How many times we lost contact with the enemy. Why was he allowed to fall back upon Paris? Why did not swarms from our mass of cavalry envelope him and cut the railways in his rear? Why did we not scout thoroughly during the winter?"

"Had our leaders felt capable of covering 30 to 60 miles a day with

sufficient masses, could the armies that were to deliver Paris have sprung from the earth and been upon us before we suspected their existence?"

"Icy roads! We have them at home, why have we not learned to move upon them? SEYDLITZ himself would have been helpless with cavalry horses that could not move on ice."

"A few brigades who had learned this accomplishment did, however, scout on the ice and the others might have done as much."

This is indeed a sharp arraignment and the Prince falls back upon *those magnificent charges;* those charges that overthrew the time-honored principle, "That in nine out of ten charges of cavalry against cavalry one side or the other wheels about before the shock." He reminds his friend that in '70 the opposing cavalries almost invariably penetrated each other and fought hand to hand in the melee. Here, however, is the very point that the cavalryman makes in proof of the inferiority of the cavalry of '70 to that of FREDERICK.

"FREDERICK charged in compact order; there could be no penetration, simply a shock. He formally discouraged loose attacks, because they led to the 'melee,' and he added 'I want no melees, the cavalry should charge in a wall.' The result of this was that the side that saw it was going to have the worst of it could do no better than to dodge the blow."

The inability to keep this compact order is attributed to insufficient training of the horses and men.

"At Vionville great masses of cavalry were frittered away, regiment by regiment, without plan and without unity. There was no one who commanded the cavalry as a whole."

They had few chiefs who dared to assume the responsibility of leading large masses of cavalry in order against the enemy; but, for this, it is the system and not the individual that is to blame.

"The SEYDLITZES, ZIETHENS and DRIESENS did not come into the world generals of cavalry; they are the expressions of their time, of the mode of instruction of that time."

"As to DRIESEN.—Did not FREDERICK exclaim, in surprise at his exploit at Leuthen, 'What! that imbecile DRIESEN?' and yet the monarch was a good judge of character."

"A genius and an ordinary man are therefore both capable of obtaining great results, their exploits are the results of the principles of their education."

"The principles of FREDERICK are still followed, in theory, but not in practice; in the manner of using cavalry, but not in the means by which the atom (the trooper) is fitted for aggregation to the mass."

"MURAT'S cavalry were certainly not drilled individually, but MURAT did not lead his men on FREDERICK'S principles."

"He formed broad, deep columns and put these masses in motion toward the point of attack. Not a trooper, had he wished it, could have given his horse another direction."

"Again, MURAT charged at a trot so as to keep his men together."

"And what did this herd of horses effect? It went through several Russian batteries and then struck several regiments of the allies, which, although much inferior in numbers, were not long in driving it back quite as fast as it had come."

"MARWITZ, with untrained and bolting horses, was successful at Habelsburg; but a cavalry that dissolves at the first charge and cannot be formed again afterwards, is of no great value, and, in fact, Colonel BISMARCK did not dare to have it charge the second time. 'I can turn them loose when I choose,' he said, 'but as for seeing a single one of them afterwards, that's another question; I won't answer for that.'"

He goes on to cite a case where in '70 a squadron of his own "melted" into a squadron of the enemy in a charge; the melee turned into a mad stampede of friends and foes; sounding the rally had no effect, and the herd was rounded up only by the sabres of the enemy's reserves.

"With a bolting cavalry it is mere chance as to the direction in which it bolts; as to whether it is victorious or beaten."

"At the manœuvres he saw another illustration of this—'six regiments of cavalry repulsed were to be supported by a division of equal force, but the retreating division bolted and, sweeping down upon its support, stampeded the whole, in a mad flight."

"In war these two divisions would have been accused of cowardice. Any cavalry, not master of its horses, is thus exposed, however brave it be."

Again, he saw a column of squadrons brought to a walk, from the the trot, to insure a safe execution of "column left."

"From October 1st to May 1st the horses are ridden in riding halls and level exercising yards."

"Then follows the school of the squadron and of the regiment on level drill grounds. It is only during the four weeks of the annual manœuvres that the cavalry has, from time to time, an opportunity to manœuvre on a natural surface."

"The trooper is then busy with each stone, each furrow that he sees: he has no eyes for the enemy, no thoughts of touch and alignment, no confidence in his seat, still less in his mount."

"Now, a chief trained in such a school cannot think of leading his division against the enemy in compact order, if he knows that the first potato patch, the slightest change in direction, will threaten the order of his command."

"He prefers rather to send his men against the enemy by squadrons,

by regiments, still keeping some of his force in hand, than to lose the whole, in several lines, across country."

It seems that about October 1st each year the squadrons receive their annual contingent of recruits and young horses, the squadron is then divided up into a number of riding classes and is not formed or drilled as a squadron until late in the spring.

The work of these riding classes is inspected at fixed intervals and the exercises to be required at each inspection are strictly laid down.

The abuses of this system of instruction are said to be at the root of the evil.

"The means has been allowed to crowd the end out of sight; school riding and exhibitions more suited to the circus ring than to the drill halls have been allowed to crowd out everything practical, until the horses come forth in the spring ruined, crammed, not trained, and ready to bolt when once more in the fresh air."

The remedies suggested are, squadron drill during the winter, route marches, individual working of horses in the open air, (using the riding halls only for recruits and young horses, except in bad weather,) constant supervision of the work instead of inspection at fixed times, and, in the school of the squadron and large bodies, a constant eye to the requirements of actual war.

The squadron is the unit; five squadrons to the regiment, two regiments to the brigade and three brigades to the cavalry division.

The squadron has three platoons and is formed in double rank.

Its personnel is one captain, three lieutenants and 133 enlisted.

In computing its strength for squadron drill in winter, we find the following data:—3 troopers (on an average) on duty away from the regiment; 4 orderlies for the officers; 2 sick; 5 on guard, in kitchen, &c.; 39 recruits; 56 men remaining for drill; 4 trumpeters; 15 non-comissioned officers, and last but not least, 135 horses, of which number, 26 are young horses, not in ranks.

It is urged that, though 56 men in rank are not enough for the normal squadron formation of three platoons in double rank, yet they are ample for two double rank platoons or for four in single rank.

Eleven files front is taken as the smallest admissible in double rank, as a smaller front than that would give the platoon a greater depth than width.

The following table will give some idea of the way in which the mount of the squadron is divided into classes for riding. It contains, however, some suggested modifications as to classification.

1st Class.—Consisting of 13 young horses (current year) with the best horsemen in charge of their training.

2nd Class. — Thirteen young horses (previous year) with the remainder of good horsemen.

3rd Class.— Thirteen horses belonging to riders of first class.

4th Class.— Thirteen horses belonging to riders of second class.

5th, 6th and 7th Classes.— Recruits on picked horses from contingents 5 to 9 years back. (Thirteen horses each class.)

8th Class.— Backward recruits of last year on horses, chosen as before. (Thirteen horses.)

9th and 10th Classes.— Old men on old horses. (Twelve horses in each class.)

11th Class.— Men riding every other day, (artificers, &c.,) on horses to be condemned next inspection. (Thirteen horses.)

We find that the squadron receives yearly, 34 recruits and 13 young horses (3 years old,) and that the recruit is not counted as in ranks for some nine months, while the horse is counted out for at least a year and a half. Ten thousand horses being required annually for remount.

We see, that the young horse is carefully trained by experienced horsemen, who still ride their own trained horses daily to keep their hands in.

That the recruit learns to ride upon the best horses, so that, while the horse is trained by the best horsemen, he in turn becomes the trainer of riders. As in the question of egg and chicken, it is useless to inquire on which side the reciprocal indebtedness began.

"The cavalry of the ancients were mercenaries drawn from nations of horsemen, but the unreliability of such troops suggested the thought of training up cavalry at home. This is the origin of cavalry schools which are properly but a means to an end."

The German system of inspection of progress of classes at fixed periods, is seriously objected to, as tending to foster rehearsals and showy performances at the expense of solid education.

The following ideas as to the riding school are of interest:—

"Instruction in classes is a necessity imposed by the scarcity of instructors; but this instruction should contain no more of the simultaneous element of drill than is absolutely necessary, and as much individual teaching as possible. Time and trouble will be saved by exercising the horses under trained riders before the recruits mount."

"Instruction should begin on the pad with arrangements for attaching stirrups. These latter should, however, not be used too early. When stirrups are issued, it should not be to the whole squad but to each man as his progress requires them."

TRAINING HORSES.

"A dead load in the saddle is found to tire the horse more than a rider of three times the weight. Young horses feel a load more when at the halt than when in motion."

"When the horse breaks from the trot do not check his speed but bring him down with bit and leg."

"The saddle horse must be trained to carry back his natural centre of gravity to the centre of gravity of the rider."

"A rapid method of training a horse to a collected action (with his hind quarters well under him), is to round the corners of the hall, with the hind quarters thrown well away from the wall (towards the centre of the circle described).

"The gallop should always cover more ground than the trot, otherwise the trot is sufficient."

"Distances, in the hall, are not to be gained or lost by change of gait but by rounding the corners more or less exactly."

"If your horse offers an unexpected resistance to-day, you must have made a mistake yesterday."

As an instance of the unreasoning severity once in fashion, an instructor is quoted as follows:

"Two good digs of the spur throughout the squad!" "Two more, good ones!" "And now, two more to please me!"

"Much of the fancy riding of the schools has come down to us from the 'Charge in Dispersed Order,' which up to 1740 was one of the regular forms. Each horseman used to caracole before the front of the enemy discharging his bullets, and avoiding the shots of his adversary by means of pirouettes and all kinds of artistic manoeuvres, the relics of the middle ages."

"The old time horse was coarse and sluggish; he could stand flesh, but the animal of to-day, with more or less blood in him, requires daily much fresh air and exercise to keep him in condition."

"Epizootic can be not only treated but prevented by fresh air, and the less a horse is in his stable the purer will the stable be when he is there."

"Periods of two or three weeks are taken up, several times a year, to rest and fatten up the horse after some unusual exertion, such as the manoeuvres, etc., but, if the animal were never allowed to get fat and sluggish, there would be no need of such rests."

"The best oats the German cavalry ever had were what they got in France when freed from the evils of the contract to lowest bidder."

MOUNTED GYMNASTICS

are highly recommended, and it is suggested that the instructor place his hands on the leg or wrist to assure himself that it is motionless during exercises of the opposite member.

"Some recruits require time to develop the proper fork, so that the buttocks may find the bottom of the saddle. If the rider does not envelop his horse properly, he seeks to secure his position by main force, carries his buttocks back, his legs forward, and hangs on the rein."

"The reins are usually given too soon; the horse is worried and the recruit spoiled. The seat should be thoroughly secured before the reins are lifted from the horse's neck. This may be done with the horse on the longe or led by another mounted man."

"We sometimes hear it said, 'He has no seat, but a good hand.' Pure nonsense! Without a correct, sure and free seat, he cannot ride his horse well, and he who does manage his horse properly must necessarily have a good seat. The reverse, however, is not true; the seat is but the first step and does not imply good riding."

"Again, a trooper may ride boldly, he is not to be unseated but he cannot manage his horse; while another has a correct seat, is supple; his limbs act independently of each other, with precision, and under control, but he has not the necessary strength of leg to keep his saddle at an unexpected movement of his mount."

"Never close the leg more than a hand's breadth behind the girths; never, on the flanks where the spur is to be used for another purpose and where pressure might beget the habit of kicking at the boot."

The whip is considered a most useful auxiliary and should be short and rigid, so that a touch can be given at the exact point where it is required, and without tickling the horse.

"'Avoid short reins,'—A horse fumbles and balks at a leap, the colonel cries, 'halt!' 'drop reins!' 'close legs!'—then, when all this is done he shouts 'forward.' The horse shoots off like an arrow and clears the ditch. Saddle galls in front on the left and in rear on the right betray a short rein."

"The martingale is of no use, except for flat racing.

1st.—It gives a false carriage to the head, and the horse is far more likely to resist its action than to yield to it.

2nd.—If short enough to have any effect, it hampers the horse in his movements, especially in leaping, and it brings him down if he stumbles.

3rd.—It deprives the reins of their lateral action.

4th.—It weights the forehead with extra harness.

5th.—Its rational use requires two hands and it is therefor unsuited to cavalry.

6th.— It requires more time in bridling and makes it difficult to lead the horse."

The author saw more martingales among the officers of one regiment of infantry than in a brigade of 1400 cavalry.

"An easy and firm seat is the solution of many a problem for which the inexperienced rider seeks a special harness."

"Bits should be easy and carefully adjusted to the mouth "

Nose bands or bridles are recommended as preventing the horse from fully opening his jaws, and escaping the action of the bit by passing his tongue over it and out of the mouth.

"A horse with the bit under the tongue will pull as though working up to the bit, when in reality, he is dragging behind it and is not in hand."

THE INFLUENCE OF SPORT.

"Reluctant though he may be to admit it, the cavalryman is deeply indebted to the civilian for improvement in horses, and, perhaps, also in riding. To go a step further, he is under obligation to the civilian of England; for, the impulse of improvement was given by the importation, about 1843, of racing, steeple chasing and fox hunting."

"Unfortunately the army officers of high rank did not take advantage of the awakening interest in sport and allowed light headed young victems of anglomania to become the exponents of the new ideas."

"English slang, conventional dress and saddlery and a grotesquely exaggerated jockey seat, were received as the essence of English sport."

"An intelligent rider, 'we were told,' considers his horse only as a means of locomotion, to transport him rapidly from point to point—in what manner is of no importance, &c. &c." The air was full of such wise saws. "Naturally the reaction set in, the anglomaniac was an object of persecution; arrest was a common punishment for riding the English trot."

"Gradually, however, it was realized that English sporting notions had been misrepresented; and, an intelligent interest having been awakened, the anglomaniac withdrew into obscurity before the strong light thrown on the sport he had caricatured."

"In 1861 the English trot was officially sanctioned by PRINCE FREDERICK CHARLES; and it may be inferred that there is no danger of a return of hostility to sport when we read, that, in the autumn of '86, two generals of cavalry followed a hunt on bare backed horses."

"If the generals of 1853 had been still as young and active as they were in 1815, when they had held nearly the same rank, they would, themselves, have taken the lead in the sporting movement; they would

have directed it, and they would have obtained a warlike cavalry; as, also, they would, by their personal presence, have prevented the abuses mentioned."

"It is a well known fact that the taste for riding is lost between 40 and 50; having arrived at this age officers confine themselves to the strict necessities of the service. Now, the strict requirements are not sufficient to keep up practice in riding; the 'go' is lost, the warrior spirit disappears; and, when war breaks out, when riding must be done, it is a fatigue, it is the cause of many sufferings that destroy all pleasure in warfare."

"Neither FREDERICK nor NAPOLEON were accomplished horsemen, they knew what could be required of cavalry and they had other things to occupy them, but the better an officer rides and drills the more agreeable will the service be to him."

"If he knows only the monotony of routine, the grind of a stupefying service that has in view only the great day of inspection, he cannot have a passion for his profession, he will become skeptical, blase, and will prefer the charms of an elegant boudoir to those of his saddle."

Hunting and paper chasing are strongly recommended as developing the style of riding required for cavalry.

"Steeple chasing and racing have greatly improved the breed of horses and the methods of training; but, as speed enters too largely into races, such sports should be encouraged among the non-commissioned officers, only when they can be supervised by an officer with a firm hand, and the course and conditions should be such as to develop military riding."

"The great difference between the steeple chaser and the charger arises from the fact that the rider of the former leaves full liberty to the daring power of the hind quarters, supports the head firmly with both hands, and is careful not to hamper the pace."

"The charger on the contrary should never bear hard on the bit, as he is ridden with but a single hand; and he must be able to stop and turn short instantly, his hind quarters being always sufficiently gathered under him."

"He must be accustomed to keep himself poised and collected with but slight support of the bit; for, in heavy column, in line, amid dust and powder smoke he cannot choose his footing, nor can his rider, who is otherwise occupied, give a thought to the matter."

"The charger must be trained to leap high and far, often unexpectedly, without a rush, and without losing the equilibrium of his movements. Last but not least his gait is that of the slowest horse in the line."

"Again, a good steeple chaser may run away in every race; provided he answers the indications of direction, the jockey cares little what

happens after the finish. The jockey may kill his horse to win, the trooper must save his mount."

"When a steeple chaser refuses a jump, they say, 'he don't feel like it to-day, he must have slept badly.' The charger must always obey."

"The position of a good English jockey — not that of the anglomaniàc — does not differ, as far as the thighs are concerned, from that of every good rider; but it is much more difficult to observe, because of the strain on the hands, and because the upper body must be carried forward to relieve the hind-hand and allow it to act only on the speed. The fore-hand giving the support."

"A good rider may carry his legs forward for relief, as long as he does not need them, but the thighs and buttocks always preserve the correct position, and, as he approaches an obstacle, the legs return to place, and the centre of gravity of the horse is brought back farther under that of the rider."

"If the military rider adopts, at quick gaits, the position of the jockey, he must not be surprised to see his horse lose his habitual carriage and seek support in the hand."

PRACTICAL EXERCISES.

To take the place of excessive school-riding in winter, marches on icy roads are suggested. "The hackmen and mail-rider are not stopped by the cold, and the Cavalry should learn to take care of themselves in the worst weather." The German Cavalry are now supplied with ice nails which are quickly adjusted and removed, but the men require practice in the use of them. The regulations prohibit squadron drill when the thermometer falls below 55 degrees Fahrenheit.

Swimming horses, fording, reconnoissance and forced marches are suggested as matters which might occupy the cavalry while the squadron is reduced by the absence of the recruits and instructors, as well as at other times.

We find some interesting points in the passage of fords by heavy columns on the field of battle.

"If the column crosses in a straight line, the water is dammed up; the line then becomes concave and finally breaks in the middle. By making the line convex this effect can only be delayed."

"The head of each platoon should turn obliquely up stream, as it enters the water, and should regulate on the head of the preceding platoon, while the rear should incline down stream. This leaves a passage for the water between platoons, while preserving the formation of the column."

The column of platoons would, it may be observed, give the same free

passage, but the dress of the platoons would be harder to preserve in the water than the form of the oblique columns suggested.

"The value of reconnoissance is emphasized by the number of instances in which, in '70 and '71, Cavalry made long detours and lost hours on the battle-field through failure to reconnoitre fords and slashings in their immediate front."

FORCED MARCHES.

"Forced marches should not be carried to extremes without previous careful training. Loss of flesh does no harm, but, when the legs and feet give out, the limit of usefulness has been passed."

"In marches on instruction the constant passage from column of sixes to threes and twos and back again, is a waste of time and strength, which could be better employed in long trots. The front into line, however, is legitimate in these circumstances, as the command cannot be too well prepared to take the charging order."

"Long rapid marches, with passage of defiles preceding the arrival on the charging ground, are most useful exercises in view of the long range of modern fire, and of the immense distance between the reserve, where the cavalry will be posted, and the first line, where it will be ordered for the charge when the general in command sees the moment for its employment approaching."

"I have been present," says this Cavalry Chief, "at five great battles amid masses of cavalry; every time it was, or would have been, necessary to cover great distances and to pass defiles before being in position to take the charging gallop."

"Masses of cavalry should be exercised not only in forced marches up to 30 miles per day but also in covering a mile or two rapidly (without arriving out of wind) and passing quickly from column to order of combat."

"Inspectors too seldom concern themselves with marches. They find it more convenient to take up a position on an eminence and enjoy a series of varied and lively tableaux, a succession of rapidly succeeding charges, than to accompany a cavalry column for an hour at a slow trot."

"He ridicules the manœuvres on known ground against an imaginary adversary, whose actions are limited beforehand."

He would have the inspector look,

1st.—To discipline on the march.

2nd.—To regularity of gait at the steady collected trot.

3rd.—To condition of the horses.

4th.—To crossing of obstacles (quite a different matter on the march from leaping on the track).

5th.—To the passage of a defile with 24 squadrons.

Describing General WRANGEL as a type of a thorough inspector, this officer says: "We saw him approach, a little dried up old man, without stirrups, as though soldered to his horse, with his severe face, criticising everything with biting, caustic remarks. Every one of his expressions was an epigram, a fact, which made his reproaches carry farther. He was no respecter of persons. When he saw something to blame he did not care who was hit. Previous service, family, age, were nothing to him. It was said that he had a stone for a heart. When some one did not appear to him to be sufficiently supple on horseback, he expressed his regret that he should not see him again, and he obtained his retirement from active service. He was very lavish of arrests."

DRILL OF THE SQUADRON.

"During the period when the squadron is incomplete it should be drilled twice a week, and should have a march of instruction weekly."

"The squadron drill proper should be short and sharp – say half an hour — to be followed by individual work."

"FREDERICK THE GREAT said: 'If the trooper passes a day without *working* his horse, it is a day lost.' This *working* meant *individual work.* It consisted, in learning to move in any direction, at any gait, at will; in crossing broken ground and obstacles at full gallop, without deranging the seat; and in using the arms."

"The type of FREDERICK'S charges has been lost because our modern riders are too little drilled in the style of riding required, and in practical manœuvres."

"The origin of the aversion to individual working of horses and to dispersion as foragers, lies in the bad riding of the men, who get out of hand when anything outside of the regular routine is demanded."

"Individual working and instruction are now, more than ever, important, since we have no longer, those pillars of the service, the old sergeants: our non-commissioned officers finding good positions in civil life."

"The inspector can ascertain the proficiency of the squadron in individual work, by sending men out of ranks on particular errands, requiring full mastery of their mounts."

"Too much stress should not be laid on precision and detail in such movements as passing from column of sixes to threes, and in the many small movements of that class; this precision is a relic of time consuming and useless movements, borrowed from the Infantry in 1812; it hampers motion and speed."

The changes due to the Franco-Prussian war are:

1st.— Attention to scouting.

2nd.— Fixed, but elastic, rules for handling large masses.

3rd.— Greater mobility of masses, through the introduction of the

line of columns: through the adoption of central direction in platoon and squadron, and through the rejection of all inversions and of all evolutions, without tactical object.

4th.—Increased importance attached to individual instruction and training.

5th.—The issue of a fire arm of long range and the thorough instruction of each trooper in marksmanship.

"The French were admittedly superior to us in '70 in the use of their arms, and that is a point not to be neglected, for without proficiency there, the best cavalry is but food for powder."

"Avoid anything like a menu in drill; let everything be the outcome of place and moment."

"Fighting on foot is only an expedient to be employed when the Infantry has not yet come up."

"The sabre and lance are the arms upon which Cavalry must rely to realize its especial functions. Its evolutions must all have in view the attack."

THE RALLY.

"To know how to rally rapidly is one of the most essential requirements for Cavalry."

"There must be a reserve with which to give the last decisive blow, but this reserve must finally be employed, and the squadrons first engaged must, by that time, have rallied and be themselves available in its place."

"FREDERIC made this rally a great point, and he prescribed that after every charge in compact order 'the command disperse should be given,' but he adds, 'not that it is the intention to do this in the presence of the enemy; you must tell the men that it is to exercise them in rallying. The dogs will always disperse in spite of you after the shock.'"

Many examples are cited of the value of the faculty of dispersing and rallying rapidly, notably where marshy and wooded ground was passed by dispersing and, by prompt rallying on the other side, a charge in line was delivered from a quarter whence a charge had been deemed impossible.

"The rally should be used whenever a class, a platoon or a squadron is assembled, either on foot or mounted; each man learning to find his particular place in the particular formation for which he knows the rally is sounded. It is only by constant practice and by constantly varying the circumstances and the formation that the squadron can be rallied, at the first signal, without collision of horses and without injury to the riders."

"Cavalry should always be reinforced and supported by sending up the reinforcements, never by falling back upon the supporting troops This latter method is borrowed from the infantry and is totally at variance with the spirit and requirements of mounted service."

CENTRAL DIRECTION.

The captain, in front of the centre of the squadron, is always the guide, according to the German regulation, but this provision is considered faulty for the charge, as the slightest inaccuracy in direction will produce breaks, and as the gaps formed by the fire of the enemy will not be promptly closed.

It is urged that in the regiment, and even in the brigade in line, the guide should be the centre of the whole line; guide right in squadrons of the left wing, guide left in those of the right wing. They are reluctant, however, to weaken the principle that makes the squadron commander, practically, as well as theoretically, the leader of his men. The captain should remain the guide until the command "To the charge," which should be the signal for "guide centre" for the whole line.

Guide right, for squadrons of the left wing, means that each squadron would regulate on the chief of its right platoon.

A neat expedient is mentioned by which a colonel obtained cohesion in the charge, with Cavalry on whose training he could place no confidence. With four squadrons in line, he wheeled the first, "half left," the fourth, "half right," just before the command charge, so as to produce such a packing that not a trooper could wheel off, and so that at the moment, anticipated, when his command would bolt, it should bolt towards the enemy.

THE CHARGING GAIT.

"The men and horses must not be allowed to regard the charge as anything unusual, as any cause for excitement; horse and rider must be as cool at the charging gallop as at the walk. The more practice we have at quick gaits the more we can count upon cohesion in the charge. Long gallops must be required if the cavalry is to find its true element on the enemy's flanks."

To regulate the gaits, the German regulations recommends drill in single rank, with intervals of one horse length between files; and, afterwards, a similar double rank formation, with one or two horse lengths between the ranks. This formation obliges the trooper to ride his horse independently, and he can be held individually responsible for the result, not being dragged along by the mass.

"Preparatory to this open order drill, the instructor should take up a position, and have his men gallop around him in a swarm, on a large circle."

"In such a shape they will not torment their horses about dress and intervals, and the instructor can easily correct faults in individual riding. This experience is especially useful in broken ground with plenty of obstacles."

It is interesting to find, in this connection, the recommendation, that provision be made for an open order formation similar to our own mounted skirmish line — one in which the men are in hand and capable of manœuvreing. The Germans seem to have nothing of the kind.

A *hunting gallop* is recommended for the charge, but the charging gallop and the command "charge," just before the moment of the shock, cannot be given up; if only because of the moral effect they produce in one way or another.

"In charging infantry or artillery the charging gallop is not indispensable, but it is imperative against cavalry."

"Against cavalry, keep the trot a long time, take up the gallop only when quite near the enemy to get the horses in wind, and command 'charge,' a little before the shock."

"The trooper should look straight to the front, without turning his head to watch the alignment."

"The 'boot to boot' is taken only for the charge, at other times there should be more room in ranks."

"The effect of a charge should be judged from the front, where an idea can be obtained of the shock and cohesion; in judging from one wing these points are missed and direction is the only point considered."

"FREDERIC inspected his cavalry in the field, not on the drill ground; he took his stand where he pleased, and required the cavalry to charge upon him in compact lines without being thrown into disorder by the ground."

"A chief who can lead his troops against the enemy over all kinds of ground will consider, as perfectly natural, strokes of daring which, to another, would appear to court disaster."

"The leader educated in such a school knows, when he comes to high command, what can be required of his men. It is thus that we can form leaders, not, indeed, such as SEYDLITZ, ZIETHEN and BLUCHER; these were geniuses, which the system did nothing but complete, but we can form men like DRIESSEN and the rest, and these men also did great deeds."

THE ORDER OF COMBAT.

"The order in which charges are to be made should not be fixed, but should be dependent on the object and the circumstances."

"FREDERIC's order for charging was, first, a compact line, boot to

N. B.—SEYDLITZ placed his recruits and uncertain men in the front rank, with the veterans behind them, to keep an eye on them and urge them on (if they did not charge squarely,) by tickling them with their sabres.

He appears to have had an obstinate streak in him: for, when ordered at Zorndorf, to charge before he thought the proper time had arrived, he refused; and, when FREDERIC threatened him with the loss of his head, he replied, "That after the battle his head was at the disposal of his Sovereign, but that, during the action, he insisted on using it in the interest of the King."

boot; a few hundred paces behind the wings of this line, and extending beyond them, 5 to 10 squadrons of hussars, destined to fall upon the flanks and rear of the enemy with the sabre; next, came the second (or what we should call the third) line, destined to follow, directly, the first, and fill the gaps."

"If the second line is to produce the principal effect it should, of course, be the stronger."

"For instance, the first line can attack on the flanks and the second line straight to the front. This stratagem has often been successful at manœuvres. The action was as follows:"

"The enemy was charging the first line, which, having wheeled its platoons 'half right' was galloping off, and he was hoping to strike it in its flank movement: but the dust raised by the first line had masked the second, which had preserved its original direction. The first line then reformed by wheeling its platoons 'half left,' and the two lines enveloped the enemy so well, that there could be little doubt of the success of the manœuvre."

"The thinnest stratagem often succeeds in the excitement of battle. The mere fact of feeling capable of a premeditated ruse is, in itself, a superiority over an adversary who has not so much assurance."

"BLUCHER once feigned a retreat, and, having drawn the enemy upon his regiment of hussars he suddenly sounded 'front,' and 'charge!'"

HYMMEN had the two halves of his squadron retire in opposite directions, then sounded 'front,' and charged in flank two whole squadrons, which he overthrew."

To sum up the ideas of this General of Cavalry:

He would regard the riding hall and drill ground as a necessary evil;

He would regard the riding school as a means to an end;

He would improve bad drills and manœuvres by improving the individual rider and horse;

He would have practical instruction of every kind;

He would insure orderly charges by making them every day affairs for horses and men;

He would enlarge the field of usefulness of the rally, and increase the time devoted to it in drills;

He would have independence of set rules for battle order, and would make the leaders dashing and daring, by training them to regard as every day affairs, enterprises at which they would naturally hesitate.

Finally, we notice that the belief in "shock tactics of cavalry on the battle field proper" seems to be so generally professed, that the propriety of its employment in this manner is not even questioned in the whole discussion.

REMOUNTS.

By CAPTAIN MOSES HARRIS, U. S. A.,

First Cavalry.

IN discussing the various wants and needs of the cavalry, it is believed that there is no subject of more vital importance than that of its remounts. Cavalry of the most perfect efficiency in points of discipline, instruction and armament becomes comparatively worthless, as cavalry, when poorly or indifferently mounted, and if through the agency of the Cavalry Association, our arm of the service is to be improved and benefited, it would seem that serious attention to this matter should not be delayed.

The artillery have a standing cause of complaint in that they are given no share in the work of devising and constructing the guns which it is their function to make use of, and yet their guns are provided by a corps of specialists educated for the purpose. Will it be conceded that horses are to the cavalry of less importance than guns to the artillery, and will cavalry officers acquiesce without a protest in the recent changes brought about by congressional legislation, whereby the inspection and selection of cavalry horses is delegated to the civilian employes of the Quartermaster's department?

It is not the object of this short paper to present any elaborate plan or scheme for supplying cavalry remounts, but to point out some of the defects of the present deplorable system, and to make such suggestions as may tend to a discussion of the subject, which it is hoped will eventuate in change and improvement.

A familiarity on the part of cavalry officers may be presumed with reference to the past methods of inspection employed by the Quartermaster's department in the purchase of horses. Until within the past two or three years a board of officers has generally been considered necessary, and while in the composition of the boards cavalry officers have been preferred, it has frequently happened that officers of other arms of the service have been employed on this duty.

The method of purchase by advertisement and contract failing to give satisfaction, in some military departments a few years ago a trial was given to open market purchase. Boards of officers were appointed from the organizations requiring horses and were permitted to go into the districts where horses could be procured and purchase such horses as were found acceptable; the only restriction being as to a certain average price for all of the horses purchased. This method gave great satisfaction to the cavalry, but was objected to by the Quartermaster's department, and having no warrant of law to sanction it, had necessarily to be abandoned.

Until 1884 the purchase of cavalry horses was provided for in the annual bill for the support of the army by an item appropriating a certain amount, leaving its disbursement subject to the general provisions of law. But in the act making provisions for the support of the army for the fiscal year ending June 30, 1885, we find it. "*Provided*, That hereafter all purchases of horses under appropriations for horses for the cavalry and artillery and for the Indian scouts shall be made by contract, after legal advertisement by the Quartermaster's department, under instructions of the Secretary of War, the horses to be inspected under the orders of the General Commanding the Army, and no horse shall be received and paid for until duly inspected."

In the appropriation bill for the following year no special provision relative to the inspection of the horses was inserted, but in the acts making appropriations for the support of the army for the fiscal years ending June 30, 1887, and June 30, 1888, it is *provided* "That no part of this appropriation shall be paid out for horses not purchased by contract, after competition duly invited by the Quartermaster's department *and an inspection by such department*, all under the direction and authority of the Secretary of War."

It is to be presumed that under the authority of this law it is within the power of the Secretary of War to order a supplementary inspection, by cavalry officers, of the horses purchased, but it is apparent that even he has not the power to dispense with the inspection by the Quartermaster's department which the law requires.

During the past two years the practice has been for the Quartermaster's department to make the required inspection by means of hired citizen experts—so called.

This is a reversion to the methods of the first days of the Rebellion, which filled the government corrals with thousands of worthless animals, which in many instances died before they could be sent to the front and which resulted finally in the establishment of the Cavalry Bureau, by which means the inspection of the horses was placed in the hands of cavalry officers. The improvement in the character of the remounts which immediately followed is a noteworthy fact in the history of the

civil war, and the establishment of this Bureau marks the point at which our cavalry began to attain that superiority which contributed so effectually to the successful termination of the struggle.

Paragraph 273, Army Regulations, states that the following specification will govern in the purchase of cavalry horses: "To be geldings of hardy colors, sound in all particulars, in good condition, well broken to the saddle, from fifteen to sixteen hands high, not less than five nor more than nine years old, *and suitable in every respect for the cavalry service.*"

If these specifications were in practice accurately observed by the citizen inspectors of the Quartermaster's department and the horses provided were in every respect suitable for the cavalry service, the law which prevents cavalry officers from having any voice in this important matter, upon which the efficiency and usefulness of their arm of the service depends, would still be objectionable as tending to destroy that sense of responsibility which is the stimulus which makes good and competent officers, and contributes to that *esprit de corps* the absence of which is a condition of stagnation and inefficiency.

Whether or not the horses purchased under the present system comply with the requirements of the regulations, and are in every respect suitable for the cavalry service is a question for cavalry officers to decide.

Within my experience those provided have not generally complied with the specifications. They have not been suitable for cavalry service, and have not compared favorably with those inspected by cavalry boards. On the contrary many of them have partaken largely of the characteristics of the Clydesdale, Percheron and Norman stallions—clumsy, logy, heavy limbed brutes calculated to break the heart and destroy the usefulness of any good cavalry soldier so unfortunate as to be obliged to ride them; while others of weedy growth, with their long legs and backs, appear to have been the refuse progeny of trotting stallions, bred to inferior mares. Both classes equally unfit for cavalry service and likely to be abandoned on the first march in which the powers of endurance of proper cavalry horses should be at all tried.

It will be said that the kind of horses most desirable for cavalry use are not largely bred and that they are difficult to find. Which is but an additional reason for careful and patient inspection by officers whose profession teaches them to know a cavalry horse when they see one.

It is in the nature of things that inspection by a board of officers, zealous only for the good of their corps, will be more carefully and efficiently made, than by a hired citizen, imperfectly informed as to the requirements of the service and open to many influences of a nature unknown to honorable and self-respecting officers. What cavalry officer is there, who, having been associated on boards of inspection with citizen experts, has not observed a disposition on the part of the expert to favor

the contractor to the utmost extent consistent with the maintenance of his position, and harmonious relations with the members of the board?

The feeling that cavalry officers are unduly particular in making inspection, and that cavalry boards are obstructive to the rapid transaction of business has frequently found expression in the utterances of officers of the Quartermaster's department, and it is believed that their preference for inspection by their own methods is largely based upon the apparent diminution of labor and trouble in procuring horses. Only apparent, because horses unfitted for the service will not last, are an unprofitable investment, and must be much sooner replaced than those that are well selected and suitable.

In looking about for a remedy for evils, past and present, connected with cavalry remounts, it becomes apparent that the contract system is answerable for much of the trouble and dissatisfaction. That system when applied to the purchase of cavalry horses, becomes absurd and inapplicable. The specification "suitable in every respect for the cavalry service" conveys no information to the average bidder as to the kind of a horse wanted, and indeed it is well nigh impossible to specify all of the qualities required to make a perfect cavalry horse. The qualities required in a recruit can be as easily enumerated, and yet it would be absurd to expect to procure recruits by advertisement and contract as we do our horses.

From my observation as a member of inspecting boards at various times and places I have found the usual procedure in the case of purchases by contract to be about as follows: The contract having been awarded to the successful bidder at a figure which should procure horses of a fairly good quality, the contractor with the government looks about for one or more dealers to whom he sub-lets the contract securing for himself a handsome profit with little or no trouble. The sub-contractor sends out his agents and looks up small dealers to whom he agrees to pay a certain sum for each horse accepted by the board. A contract is frequently sub-let in this manner through three or more hands with the result that the first owners of the horses accepted by the board receive from twenty to forty dollars less for each animal than the contractor receives from the government.

Horses are readily classified according to their value, and horse owners will not present to the board of inspection horses valued at, say one hundred and forty dollars, which may have been the contract price, when they are to receive not more than one hundred dollars according to their agreement with the agents of the contractor.

It may be said that it is the duty of the inspectors to prevent this by refusing to accept horses of inferior quality, which may be granted. But when this course is pursued what is the result? After the board has

labored for a considerable period and has accepted perhaps not more than four or five horses out of each hundred presented, the contractor cries out that the inspectors are unduly severe, that such horses as they require are not to be procured. The Quartermaster becomes impatient, generally adopts the views of the contractor, and finally the board is dissolved or the obstructive members are relieved. Of course, this is not the invariable method; but it is certain that the contractor will always endeavor to put in low priced and inferior horses and that he will succeed unless prevented by the firmness of the inspectors.

There is but slight doubt that as long as this system of purchase is retained business can be conducted more smoothly, and with less trouble to the Quartermaster's department through the means of a citizen inspector than by a board of cavalry officers.

Inspection by citizen experts is an inseparable condition of the contract system of purchase, and both evils should stand or fall together. The efforts of cavalry officers to secure proper and suitable horses under this system must inevitably, in their contact with officers of the Quartermaster's department produce friction and irritation.

The remount question has been well treated in an article by Lieutenant S. C. ROBERTSON, 1st Cavalry, published in the *Journal of the Military Service Institution* for June, 1887, but the phase of the question which I have dwelt upon — the substitution of the citizen inspectors for Cavalry Boards in the purchase inspection, and the evils of the contract system, appear to have escaped the attention of this officer.

The defects pointed out by Lieutenant ROBERTSON are the following:

"1st. That special breeding in other directions is rendering it more "and more difficult each year, to obtain the proper type of cavalry "mount.

"2d. That the absence of depots in accessible places to which raisers "could bring their animals for sale, and the desultory manner in which "Purchase Boards are compelled to travel through the country in search "of material, is not a system best calculated to obtain such animals as *are* "fit for the service.

"3d. That the fluctuating nature of prices, depending upon the "amount of the yearly appropriations, is not calculated to encourage the "raisers to seek the Government market. A dealer who is offered only "$125 for an animal for which another Board, more liberally supplied with "funds, would have the year before given $150, is naturally disgusted "and inclined to seek a more equable mart for his wares.

"4th. That officers are rarely put upon Purchase Boards with regard "to special fitness therefor, and that the changeable character of the yearly "boards allow few to even become experts. In European cavalry the "'remount officer' is selected from those specially trained in hippology,

"and fitted by their knowledge of the horse and the tricks of dealers, to "competently purchase him. The services of such men are highly valued, "and they are continuously kept in demand. By this means their know- "ledge of the market, and their relations with the different dealers, re- "main unbroken from year to year, with obvious advantage to the Gov- "ernment."

It will be observed that in all these defects except the first a condition of affairs is presupposed which no longer exists, and that to the defects enumerated by Lieutenant ROBERTSON must be added the two enormous ones of the contract system and inspection by citizen experts.

Two alternative remedies are considered by the Lieutenant.

The first is one proposed by Captain GEORGE E. POND of the Quartermaster's department, which is that of a "general horse depot on the same "plan as general depots of the Quartermaster's department for supplying "the whole service with all animals for cavalry, artillery or draught "purposes. The depot to be directly under the Quartermaster-General, "and to keep on hand a reserve supply of animals."

In considering this plan the Lieutenant provides that the officer in command of the depot should be of high rank and a *cavalry man par excellence* with his command entirely separated from service with any other corps relative to the duties of his garrison; that he shall be assisted by an able corps of subordinates specially selected for their interest and skill in everything pertaining to the horse; and that a battalion of cavalry large enough to furnish one private trooper for each two horses be attached to the depot. A permanent Purchase Board of three expert cavalry officers with an officer of the Quartermaster's department attached, is another important provision of his depot plan.

The general purpose of the depot, as sketched by Lieutenant ROBERTSON, would appear to be to provide a place in which the horses purchased after proper inspection might receive suitable instruction and training to fit them for service when drafted to regiments, and where officers and men might also receive valuable instruction. There can be no two opinions as to the good results which might be expected to follow from the establishment of an institution of this character, whatever may be thought as to the practicability of the scheme.

It is stated in Lieutenant ROBERTSON's article that Captain POND who suggested the depot plan, "objects to the Purchase Board of three officers as being cumbersome and productive, from lack of unanimity of opinion which often exists among them, of delay in the transaction of business;" from which it may be inferred that the plan as developed by Lieutenant ROBERTSON bears but slight resemblance to that proposed by captain POND; and it is safe to predict that no plan for the establishment of a

depot, or depots, to be placed under the control of cavalry officers would receive encouragement or toleration from the Quartermaster's department.

As regards the other alternative remedy proposed by Lieutenant ROBERTSON, that of a Breeding Station, its realization is so remotely improbable that is does not come within the practical view of the subject which I have preferred to take. It is possible that some of the younger cavalry officers may live long enough to see such an institution established, and they cannot use their pens to a better purpose than in building up a sentiment which shall lead to improvement of that character.

But looking to the present and pressing needs of the service the remedies which I would suggest as being worthy of consideration may be briefly summarized into, 1st. The abolishment of the contract system of purchase with its inspections by citizens, and 2d. The establishment of an invariable system of purchase in open market by boards of cavalry officers.

For the proper working of this system a standard price to be paid for a cavalry horse should first be determined and fixed. The price of horses in the market does not fluctuate greatly from year to year, and there is no wide disparity of prices in different parts of the country. But if deemed best the price could be fixed by the Quartermaster-General each year and for different localities.

The amount appropriated by Congress for cavalry remounts should be apportioned by the General of the Army among the several regiments according to their needs and the requirements of the service.

The disbursement of the several sums should be made by the Regimental Quartermasters under the direction of the colonels of regiments, who should designate the officers for the Board of Inspectors; which should be a permanent body in each regiment, composed of the veterinary surgeon and a suitable number of officers.

The horses should, as far as practicable, be bought at the headquarters or principal station of the regiment, or as close as possible thereto.

Upon the establishment of this system it would soon become known that at every large cavalry station there was a constant and unfailing demand for horses of a certain type, for which fair prices in cash would be paid. The demand would certainly result in the forthcoming of a supply; and the Boards of Inspection by keeping before them a high standard, would as certainly improve the character of the horses presented and correspondingly the excellence of the regimental mounts.

The opinions and criticisms of his brother officers would stimulate each member of the Inspecting Board to conscientious effort in the direction of improvement; as surely, the rivalry between the regiments would cause the commanding officers to exercise close supervision to see that the

amount allotted to his regiment was expended to the best advantage, to the end that his regiment should not suffer in comparison with others as to the character of its mounts.

It may be objected that this system will not be found applicable to a condition of war; but at any time it can be merged into a system of purchase and accumulation at supply depots, and will in any event give us a supply of officers competent for duty of inspection, whose services will be available in time of need.

It is confidently believed that it will also greatly improve the character of our mounts; that it will create demand for cavalry horses of a proper type; and may we not further hope that it will tend to foster such a spirit of emulation and *esprit* as will add to the efficiency of our corps, and without which there is no hope of improvement or progress.

DISCUSSION.

By Col. E. V. Sumner.

Mr. Chairman—The paper written by Captain Harris, of the 1st Cavalry, on the subject of remounts and purchase of cavalry horses, read before the society, seems to have been pretty generally approved. Captain Harris is one of our best cavalry officers, his long service having been almost constantly with his troop, his statements may be considered worthy of consideration and of value to the service. The difficulty is to convince those in authority that any statement from a cavalry officer is made solely from a cavalry view, and does not contain a prejudice. Years of experience in the care and management of horses should be taken into account, and few quartermasters in the army have had that experience.

The purchase of cavalry horses is important, as a matter of business, and as such it is difficult to perceive why it is not conducted on business principles. The law in regard to the matter is as follows: "For the purchase of horses for the cavalry and artillery and for the Indian scouts and for such infantry as may be mounted 130,000 dollars; Provided, that the number of horses purchased under this appropriation, added to the number on hand, shall not at any time exceed the number of enlisted men and Indian scouts in the mounted service; and that no part of this appropriation shall be paid out for horses not purchased by contract after competition duly invited by the Quartermaster's department, and an inspection by that department, all under the direction and authority of the Secretary of War."

Unless a strict compliance with this law will work its own repeal it is plain to be seen that there is no hope for a cavalry board, except such as may be convened to condemn worthless animals purchased under it. The number of horses condemned by these boards may be taken as a fair subject of consideration by those who appropriate the money, and provide for the manner of purchase. The procedure under the law is as follows: An officer of the Quartermaster's department is provided with the funds and directed to purchase a certain number of horses for cavalry and artillery, a citizen is employed as an expert, which is a confession at once that the officer is not capable to perform the duty. After the horses are purchased they are branded "U. S." at once, paid for and shipped direct to troops without any other inspection, and the Government is put to the further expense of transporting horses, some of which are sure to be condemned. A board of experienced cavalry officers could certainly do better than this, and I fully agree with Captain Harris that no horse should be accepted for the service, or paid for, until he has been inspected by such a board; every officer on the board to sign the report and be held responsible. Neglect to perform this duty properly on the part of cavalry officers has no doubt caused the framing of the law now in force. No officer should be detailed on a horse board who would be obliged to resort to the opinion of an expert.

Generally speaking past experience has nothing in it to recommend the board system, but proper care in the selection of officers, or the adoption of regimental boards as Captain HARRIS suggests would no doubt fulfill the expectations of those in authority, who naturally desire efficiency. It is much more difficult to select a good horse than to find the man to ride him; and when the man and horse are brought together in the service of the Government it becomes a matter of great importance that neither shall fail the other. The original purchase money of the horse, as to the amount, dwindles into significance when it becomes necessary for his rider to be on hand to assist in "saving the day;" therefore it is better and cheaper to pay a fair market price for a fair serviceable horse than to throw away a moderate sum on a poor one, and finally lose man, horse and equipments on the battle field. The object is to have every horse fully up to the standard. This, no doubt, is also the desire of the Secretary of War, who by law is invested with "all direction and authority;" but it can only be accomplished by men who understand how to examine each animal and who combine with this knowledge an undoubted interest in the service as well as a keen desire for success.

THE NEW FIELD ARTILLERY GUN AND CARRIAGE.

By CAPTAIN C. W. WHIPPLE,

Ordnance Corps, U. S. Army.

CERTAINLY by next spring new steel guns and carriages will be issued to all our field batteries. As both contain features which are novel, and from their lightness are suitable though not especially designed for horse batteries, it was thought the Association might be interested in a brief description of them.

In 1879 our field batteries were still armed with 3 inch M. L. rifles and light 12 pounder guns, which, with the 10 pounder Parrott guns, constituted the armament for this service during the war.

Appropriations for the manufacture of ordnance material were so limited that little could be done in any direction in the way of improvement. But in 1879 one 3 inch M. L. rifle was converted into a breech-loader and the results obtained were so satisfactory that it was recommended that a battery of such guns be made for issue and trial, simply as a temporary substitute for the more improved gun which was even then recognized as a necessity. The gun was converted from a muzzle into a breech-loader by cutting off the breech and cascabel, and screwing in a steel breech-receiver, in which worked transversely a sliding breech-block.

The following year another gun was converted on the same plan, but the bore was enlarged to $3\frac{18}{100}$ inches in order to remove the old lands and admit of re-rifling with an increased twist. This gun was subsequently reamed out to $3\frac{2}{10}$ inches, and was then used in many experiments for testing carriages, powders, and projectiles.

Six of these guns were shortly after issued to some of the light batteries and were accepted as a great improvement over the M. L. rifle. Its shell weighed 13 lbs., and its powder charge was 3 lbs.

This gun is mentioned because on the results obtained with it were partly based the calculations for the new steel gun; and because six (6) of them are now in service, mounted on steel carriages made at the Watervliet arsenal.

In September, 1882, the Chief of Ordnance addressed the Ordnance

Board desiring them to submit a design for a steel breech-loading field gun with the interrupted screw fermeture, directing their attention to the fact that built up guns, consisting of a steel barrel strengthened by a layer of hoops or by a jacket, were generally adopted in modern guns abroad and thought to be preferable.

It is, of course, not the province of this paper to enter into any minute or theoretical description of the construction, but I would call attention to the fact that every detail was calculated with the same nicety as if it was designed for one of the heaviest sea coast guns.

The board, according to their instructions, decided upon a piece intermediate in weight, between the lightest and heaviest field guns in use in foreign services, and this gun was ordered made at the Watertown arsenal. It was constructed entirely of American steel furnished by the Midvale Steel Company, of Philadelphia, and the trials of it commenced at the Proving Ground at Sandy Hook in July, 1884. When I left there last July it had been fired some 2200 rounds, —out of which 1800 had been prescribed as the proof for endurance — and was still not unserviceable.

Before giving the dimensions of this gun—which is identical with those to be used, except in some minor details—it will be as well to enumerate or define some of the guns of foreign services, with which it may be compared, and those have been selected which are classed as horse artillery guns in order to show by the comparison the adaptability of our own for this especial service :

Denomination	Material.	Calibre inches.	Weight lbs.	Length in calibre.	Powder charge.	Weight of projectile	Muzzle velocity.
Krupp....75 c. m.	Steel hooped.....	2.95	517	24	1.65 lbs.	9.5 lbs.	1378 ft.
Austrian 8 c. m. (7.5 c. m.)..	Compressed bronze.....	2.95	660	24	2.09 lbs.	9.9 lbs.	1378 ft.
English...9 Pdr. M. L.....	Steel body, wrought iron jacket	3.00	672	22	1.75 lbs.	9. lbs.	1381 ft.
Spanish...8 c. m.....	Steel body, transformed Krupp	3.09	737	22	2.31 lbs.	10.12 lbs.	1492 ft.
German...Light Mod. 73..	Steel hooped.....	3.09	858	24	2.75 lbs.	11.15 lbs.	1522 ft.
French....8 c. m.....	Steel hooped.....	3.15	935	26.5	3.3 lbs.	12.3 lbs.	1607 ft.
Russian...Light Mod. 79	Steel hooped.....	3.43	802	16.8	2.99 lbs.	15.12 lbs.	1350 ft.

With the exception of the English 9 pdr. these guns were breech-loaders, and all were in existence at the time our gun was designed. The English have since adopted 9 and 13 pdr. B. L. guns, and the Germans have a gun with a calibre of 3.15 inches; but otherwise there appear to have been slight, if any, changes made.

Now the corresponding data of the new gun are as follows :

Calibre 3.2 inches.

Weight 791 lbs.

Length in calibre 26.

Powder charge $3\frac{1}{2}$ and $3\frac{3}{4}$ lbs.

Weight of projectile 13 lbs.

Muzzle velocity 1686-1740 ft.

Consequently, with a weight which is very moderate, it has a higher initial velocity than any given above, with a shell weighing considerably more than any enumerated except that used in the Russian gun.

DESCRIPTION OF $3\frac{3}{10}$ INCH STEEL B. L. RIFLE.

It is composed of an untempered steel tube containing the bore and the seat for the gas check; of the jacket shrunk over the rear of the tube and projecting 5.6 in rear of it; the trunnion ring, sleeve, key ring, and the base ring, which, screwed into the rear part of the jacket, forms the seat for the breech-block.

It will be observed that two charges of powder were given. These correspond to different gas checks furnished with the gun and were consequent upon the different amounts of powder space which they occupied.

These checks are called the De Bange and Freyre. Each was subjected to a test of at least 1,000 rounds, and though—as is almost invariably the case in experimental work—slight changes had to be made in the earlier stages of the firing, both worked admirably. The Freyre is much simpler in construction and takes up considerably less powder space; on the other hand the De Bange check—which has been very successfully tried in this country as well as everywhere abroad in guns of large calibre—is less likely to be damaged and to that extent is preferable. The parts of both are easily replaced when injured. Both of these checks were attached to the end of steel spindles, which passed through the centre of and were secured by nuts to the breech block, and both the block and the seat for the check in the tube were so formed that the spindles could be interchanged at will.

The block itself was fastened to the body of the gun by a screw with an interrupted thread, which was locked and unlocked into corresponding threads in the base ring by means of a lever handle.

The other parts of the breech mechanism are: 1st. The carrier ring, hinged to the left side of the base of the jacket, which forms a support for the breech block when the latter is withdrawn and is swung round to expose the breech for loading; 2d. The bronze or fixed handle which serves as a hold for the right hand in withdrawing the breech plug; and, 3d and 4th; the stops and the latch pin for carrier ring, the former serving as guide for the breech block during its manipulation, and the latter automatically locking or unlocking the carrier and jacket in such a manner that they may be united while the block is being slid in or out, and disconnected when it is ready to be swung on its hinges.

Moreover during this last movement, the latch pin connects, by the action of a spring, the carrier ring and breech block together with sufficient firmness to prevent any probable movement of the one within the other (while the block is being swung forward for insertion) until the carrier has reached its seat. This is an important precaution to prevent the gas

check from striking and being injured. When ready for firing the breech block is locked in position by the head of the lever handle, which then rests in a recess in the upper part of the carrier ring.

In the De Bange gas check the head of the spindle is shaped like a mushroom, and in rear of it, slipped over the shank of the spindle, is a ring or pad of plastic material, which rests in rear against the face of the breech block. The plastic substance used is a mixture of asbestos, tallow, and graphite, formed into a pad in a die under great pressure. The mushroom head receives the pressure of the powder gases, and the pad, by its compression effects the obturation.

In the Freyre gas check the spindle terminates in a head having the form of a conical frustum. The head is embraced by a ring with a conical interior surface, and with its exterior surface in tight contact with the walls of the gun. The base of the ring rests against the face of the breech block, and the ring is so adjusted as to leave a slight space between this face and the head of the spindle. When the powder gases act, the head is forced back and wedges out the ring until it fits accurately on its seat and prevents any escape of gas. Though both of these checks are very durable, in service extra pads for the De Bange and rings for the Freyre check would of course be furnished with other spare parts, and could be adjusted in a few minutes.

The working of the breech block is very simple. It is opened by one man in four motions, in which he uses both hands without changing them, and, as the gun need not be sponged nor the vent pricked, the loading is accomplished very quickly. No manual has been adopted for the gun, but two cannoneers can manipulate it very rapidly in every respect, during firing, except running forward into battery after discharge, and even in this respect we are better off than with the old muzzle loader, as from the use of the check attached to the new carriage the recoil is less than before.

The remaining details of the gun which affect the ballistic properties are the chamber, which is elipsoidal in shape and 10 inches long, and the rifling in which there are 24 lands and grooves; width of lands, .12; width of grooves, .3; depth of grooves, .05, and pitch uniform one turn in 30 calibre.

PROJECTILES.

The projectiles used in testing the gun were cast iron shell and various experimental shrapnel. Both had a single copper band $\frac{1}{2}$ inch wide attached near the base to produce rotation; the shell had a Hotchkiss base precussion fuse and contained a bursting charge of $6\frac{1}{4}$ oz. of musket powder; the shrapnel had a point time and percussion base fuse; were made first of cast iron and afterwards of steel; but none had been definitely adopted when I left the proving grounds.*

* It was intended to put a point time fuse also in the shell.

The powders were of two kinds; one, called by the manufacturers, L. X., with the additional letters A, B, C, etc, according to its lot, had a granulation of 270 to the pound, and a specific gravity of 1.706; and the other, the I K type, had a granulation of 2,200, and specific gravity of 1.725.

The L X powder, which gave the higher pressures and velocities, is formed of regular, flat, square prisms, but the I K powder has an irregular grain.

To show the results obtained I have selected certain extracts from the report of the board for testing rifled cannon, which is contained in report of Chief of Ordnance for 1885.

The gun was fired over water to obtain ranges, taking a mean of 10 shots at each elevation, for every 2° from 0° to 20°. At 20° (beyond which the splash in the water could not be seen) the mean range was 6,479 yards, or $3\frac{3}{4}$ miles, with a mean deflection of $95\frac{1}{2}$ yards.*

It was fired at a target 20′x40′, distant one mile, and the mean deviation of 8 shots was $2\frac{4}{16}$ feet.

Fired for rapidity the best result obtained was 50 rounds in 25 minutes, but it must be remembered that not only was the gun run forward into battery after each round, but all the cannoniers were obliged—in accordance with the orders of the Proving Ground—to be under cover when the gun was fired, which necessitated the men running from twenty-five to thirty yards before each discharge, and the officer in charge to delay the order to fire until he personally saw that all was secure. The gun was also fired 100 rounds in 90 minutes.

Our first effort in making a suitable metallic carriage did not meet with the success attained with the gun, but there was the consolation of knowing that everywhere abroad the problem was found equally puzzling.

In the first one made in 1879 the cheeks were of steel $\frac{5}{16}$ inch thick, reinforced by angle iron, but the axle was of wrought iron, braced by rods to the cheeks. Almost at the first round the wrought iron axle commenced to bend so it was replaced by a steel one, which, however, did scarcely better. Abroad all sorts of devices were tried to overcome the same difficulty; cork and rubber buffers, hydraulic or pneumatic cylinders, all were tried to take up the excessive and disastrous recoil due to the large charges used with the new guns.

Colonel BUFFINGTON, to whom the carriage had been referred for repairs, reinforced the steel axle by two steel plates $\frac{3}{8}$ inch thick, projecting

* To give an idea of the uniformity obtained, I have selected hap-hazard the ten shots fired at 16° elevation.

The times of flight, taken with a stop watch reading 8ths, was in order: 20, 20, $20\frac{1}{8}$, 20, 20, $20\frac{1}{8}$, 20, $20\frac{1}{8}$, 20, $20\frac{1}{8}$. The ranges were 5,702 yards, 5,708, 5,671, 5,698, 5,684, 5,702, 5,671, 5,716, 5,684, 5,667, making the mean 5,690. And the deflections to the left (the wind was blowing from the right and rear 20 miles) were in yards: $23\frac{1}{2}$, $23\frac{1}{2}$, $23\frac{1}{4}$, $23\frac{1}{2}$, 38, $38\frac{1}{4}$, $23\frac{1}{4}$, $38\frac{1}{4}$, 38, 23.

front and rear and riveted together. This gave to the axle the structure of a beam with its depth in the direction of the greatest strain; from that time no more difficulty was found in that particular. Colonel BUFFINGTON also applied to this carriage a very simple and effective recoil check or brake, which reduced the recoil when fired on a platform from about 25 feet to about 7 feet.

The brake — attached to each side — consists of two rods, one of which is connected by an eye to the axle shoulder at one end and at the other is screwed into a hausing, which encloses a stout spiral spring. One extremity of the other rod, passing through the spring, terminates in a nut which bears against the spring, while the other extremity terminates in a shoe which can be fitted to the tire of the wheel. It works very simply; stops the recoil without unduly straining the wheel; can be attached or removed from the wheel at will; and on the march serves as a mud scraper.

These two — the axle and the brake — are the only features which stood the final test. No matter how repaired, the carriages of this type ultimately gave way — sometimes in the cheeks, sometimes in the trail. One, however, fairly stood a test of 574 rounds.

Carriages were needed for the converted field guns, then ready for issue and which could not be fired at all on the wooden carriage, so for want of a better a sufficient number of these carriages were manufactured and issued to the service. We had one at Sandy Hook and during the test of the steel gun it had frequently to be repaired.

Colonel BUFFINGTON then presented a new design embodying these features described above as successful, but differing essentially from other carriages in the construction of the cheeks. These were made of double steel plates, riveted together with curved flanges above and below.

It weighed 1,300 pounds and stood perfectly well 500 rounds of $3\frac{3}{4}$ pounds in the steel field gun. Its perfect condition at the close of this trial, which was made as severe as possible, caused its adoption, and 25 were ordered constructed and some are now, I believe, in service. Twenty-five extra guns and carriages were also ordered by the Chief of Ordnance, and in his estimates for this year he asks for money enough to increase this number to 100.

In many respects this carriage* resembles other modern carriages; it has a trail chest for tools which are indispensable for a breech-loader; the wheels are of wood with metallic naves; but the characteristic features are the double cheek plates, united by transoms, the spring brakes, and the flanged axle before described.

*Krupp, 75,	gun and carriage...1,672 lbs.	Spanish, 8 C. M.,	gun and carriage.. lbs.
Austrian, 8 C. M.,	" " ...1,685 "	German, 8 "	" " ..1,898 "
English:		French. 8 "	" " ..2,101 "
Armstrong, 13 pdr.,	" " ...2,184 "	Russian Light,	" " ..1,802 "
Woolwich, 13 pdr.,	...2,382 "	3 2-10 steel,	" " ..1,909 "

LIMBERS.

Metal limbers were made in accordance with the views of the Light Artillery Board 1885, but as a new design has been approved this year, I take for granted those issued were not successful. The limber body with its wheels and pole weighed 805 pounds. In order to determine the propriety of making the ammunition chests of steel, one of them, made of plates about $\frac{1}{16}$ inch thick, was sent to the Proving Ground and tested, in comparison with the ordinary wooden chest, by firing at them with the 45 cal. Gatling gun. Both chests were filled as for service with loaded shell, shrapnel, cartridges, etc. The steel chest weighed with its partitions 316½ pounds, the wooden one 185.

Beyond 500 yards the steel chest was not perforated when struck, while at 800 yards more than 50 per cent. of hits on wooden chest were penetrations.

Nevertheless, the Board decided in favor of the wooden chest, for the following reasons:

1st. If shell, shrapnel, or specially prepared explosive bullets are used, both chests would be destroyed at 400 yards.

2d. At 400 yards the wooden chest is more readily perforated, but such perforations are unlikely to cause explosions.

3d. The wooden chest weighs 131½ pounds less than the steel one.

4th. Can be repaired more readily in the field.

5th. Is much the less expensive.

The Chief of Ordnance in his report for this year states that an improved limber, caisson, battery wagon and forge for the new field guns have been made a special study during the past year by Colonel BUFFINGTON and Major WILLISTON, and that the manufacture of these carriages will be commenced at once; also that Major WILLISTON has submitted a report on his improvement in artillery harness.

As a consequence the new guns and carriages should find next spring the remainder of the battery equipment equally new and, I doubt not equally efficient.

THE USE OF ARMS, MOUNTED.

By CAPTAIN W. P. HALL,

Fifth Cavalry, U. S. A.

DURING a service of more than eighteen years in the United States Cavalry, I have yet to see the first cavalry soldier who could use his arms on horseback. I refer particularly to the revolver, and will pass the sabre by — with a few reasons for retiring, on account of physical disability, this time-honored cavalry weapon.

For the purpose of comparing the sabre and revolver I take the effective range of the former to be four and one-half feet, and that of the latter ten yards, and will assume that a sabre-thrust through the body or a hard blow over the head are of equal efficacy to a pistol-shot wound. I take it that four seconds would be required to successfully carve one man and get within sabre range of another. *I know that in three and one-half seconds* an expert pistol shot can fire with accuracy five shots from a revolver at a distance of over ten yards with horse at a run. There is no reason why a cavalryman should not carry two or even four revolvers, if he knows how to use them; and if he does not know how to handle them, I believe him better off without any. With this number of pistols it would be difficult to imagine a case where his fire would become exhausted before he had an opportunity to reload.

To recapitulate: We have for the maximum range of the sabre four and a half feet; the revolver is equally good for thirty feet, with possibilities far beyond that distance. The rapidity of execution with the sabre, four seconds, while that of the revolver is less than one second. "Surely the tenacity with which we cling to arms ancient might well make "a wise soldier laugh, were not its effects so pernicious as to sometimes "make a good soldier weep."

Some cavalrymen claim that if the sabre is done away with we are reduced to the grade of mounted infantry; others say that the time for doing good work with cavalry is ended — certainly neither of these classes can have a conception of what a terrible weapon the revolver becomes when in skilful hands. I know of but one instance where its use by a

mounted organization has ever been perfected, but the results in this are more than sufficient to establish it supremacy as a cavalry weapon, were we entirely devoid of individual cases in which a high degree of skill had been attained.

The organization to which I refer was a remnant of QUANTRELL'S command under a leader named BILL ANDERSON (claiming to belong to the confederate army), who infested the northern part of Missouri during the last year of the war of the Rebellion. These men were armed with three or four revolvers each, and at the time to which I refer numbered about fifty. They attacked, upon an open prairie, a command of our mounted troopers whose numbers I have heard variously estimated at from 200 to 250. ANDERSON'S command lost but five or six men and only eight or ten of the Federal troops escaped with their lives; the others were laid out over the prairie for a distance of four miles and were killed with revolvers. I have been informed, and I believe credibly, by men who belonged to ANDERSON'S command that mounted pistol practice was their principal occupation.

The deplorable deficiency of our cavalry in the use of their arms mounted is but too vividly pictured in the engagements with mounted Indians during the last twenty years. Here I propose to make particular reference to but one battle. At the close of our late Civil war the reputation of General CUSTER as a cavalry commander was considered by many as second to none of those gallant cavalry officers trained in this most excellent school; he commanded the 7th Cavalry for some time previous to 1876. Many of his captains had been trained in the same school of experience, and he had time and opportunity to give the 7th Cavalry the training and discipline suggested by his extended service, and it is certainly fair to suppose that this regiment in 1876 was a fair sample of the United States Cavalry.

Nearly three hundred of these troops under General CUSTER'S command were attacked in an open country, where they were expecting an enemy, and according to the best accounts I have been able to obtain, were annihilated in the short space of half an hour. The Indians claim to have lost but thirty five killed and say they crowded in upon the cavalry so as to make the fighting almost hand to hand. The cavalry seem to have been marching by fours or twos, and when attacked on one flank it is presumed they formed, or attempted to form line towards the enemy; the country is so level that the Indians would not have attacked on both flanks at once for the reason that their fire would have been almost as fatal to one another as it was to the cavalry. Now it would seem to go without saying that in two mounted organizations engaged as these were, the numbers of men on each side *actually fighting at any one time* were approximately equal, with perhaps some advantage in favor of the Indians.

I can picture the men of General CUSTER's command in this engagement as having all they could do to sit upon their horses, having little control over them and entirely incapable of handling their revolvers, which I believe to be the only weapon for mounted firing. I believe in the *short carbine* for cavalry, but think it should be used on foot only.

There is but one way to account for this and other disasters to which our cavalry has been subjected in recent Indian engagements, and that is, our poor riding and the utter inefficiency in the use of our arms on horseback. The mounted Indians have been trained all their lives at this kind of work and it is needless to say how much the average cavalryman gets. The great difficulty incident to training men to manage their horses and handle their arms when mounted only makes the accomplishment the more valuable when attained. I know the road to success in this line is far from being a royal one, and the work and drudgery connected therewith is very great, because it involves what is known as snap shooting with the revolver. I am thoroughly convinced however that one thousand men trained to use this weapon mounted would surpass in efficiency ten thousand cavalry such as we now have, and I furthermore fully believe they would in close quarters be far more than a match for double their number of infantry. Opportunities would occur in which such cavalry could surprise infantry or get amongst them under cover of night, and in such an event, with the power of firing with accuracy five shots in four seconds, and the confidence a courage which a knowledge of this skill would give them — I believe they would easily destroy more than their number before they could be checked.

The time seems to have passed when men become very eminent in more than one line, but this very condition of things brings with it the surety that an expert in any useful direction is certain to find a demand for his work; and if we propose to make a reputable score as cavalry in the future, I believe we must bend our energies to training our men to ride and shoot when mounted; with this feat once accomplished, there will be a lively demand for our services so long as there are horses to ride and powder to burn.

DISCUSSION.

BY GENERAL MERRITT.

I am too firm a believer in the value of the sabre as an arm for the cavalry to consent to its abandonment without abundant evidence that there is something better to replace it. Hundreds of years of war of every description are the vouchers for its effectiveness as an arm. Nor do I fear the charge of too great conservatism. I have listened with great interest to the paper of Captain HALL, and while I was unfortunately prevented from being present on the evening when Lieutenant SWIFT read his paper, I am told that it was quite as convincing as the other.

I am satisfied that the subject discussed by these gentlemen is worthy of careful attention by cavalry officers. We should ponder well before dismissing their propositions, but, as has been said by one of England's foremost modern soldiers, the nation that abandons the sabre will have abundant reason to regret its rash act in the first war in which it may become engaged.

Those who advocate the use of the pistol as a weapon for cavalry invite an unnecessary hostility to their proposition by insisting that it must replace the sabre. Let us rather agree that if the pistol can do all or a part only of what is claimed for it, to secure it the place it has already had in our armament, and a better place than it ever has had in the drill and preparation for its use.

This is all, I understand, that its advocates claim. It is certainly all that I, as an army officer with some experience in the cavalry arm of the service, would be willing to have conceded.

The history of the sabre is a glorious one and dates back to remote ages. I could not, if I had the time, do justice to its exploits. They are coincident and coeval with the great events of war.

The pistol, in one form or another, is as old as gunpowder. Is it not strange then if all that is now said of it is true, that some little of its merits have never been known before? Mind you, I am not prepared to say that much that our essayists have written is not true, but I beg of these gentlemen, for the sake of their own cause, not to attempt to discredit a weapon whose record is a blaze of glory, by an arm whose single exploit dates back to the Civil War, and whose one title to effectiveness is the massacre of a party of unskilled, undrilled volunteers by a band of Confederate "irregulars."

I repeat, I am very greatly impressed by Captain HALL'S views and facts. If a command of mounted men can be instructed to the proficiency he claims is possible, and I for one am not prepared to deny it, such command would be a terrible enemy to meet on the field of battle. I am not only not willing to deny the possibility of making our cavalry all that Captain HALL claims in this regard, but I am prepared to believe that it can and will be done, and that the American Cavalry will be competent in the future to teach the world lessons that will be well worth the learning. It has done this in the past, why should it not in time to come?

SABERS OR REVOLVERS?

By EBEN SWIFT,

1st Lieutenant 5th Cavalry.

ALTHOUGH the sword has not been the most effective of the horseman's weapons its position has been maintained by a brilliant literature. Some nations have even worshipped the naked sword, and we find the legend of the *arme blanche*, the beautiful white weapon, woven into every history and romance for centuries. We will also find that a great deal has been said and written about the spear and lance, pike and bayonet, bow arbalist and sling. A great amount of scientific and professional attention is devoted to the rifle, the cannon and the machine gun, and no science can show greater progress in invention than the science of ordnance and gunnery. The revolver alone has received scant attention as a weapon; there is hardly an intelligent notice of it to be found in any book, encyclopædia or pamphlet, in any language; its use in war is a novelty; it has been distrusted by its friends and ridiculed by good cavalry soldiers; and it is to-day substantially the same weapon that was patented by Samuel Colt some fifty years ago.

In the armed contests of men the combatants have been principally divided into horse and foot. To make the proper distinction and to preserve to cavalry its essential spirit, we will here define the cavalryman as one who habitually uses his arms on horseback; he may at times dismount to fight on foot, as did the English Knights at Cressy, or Sheridan's troopers at Appomattox, but the spirit, the life and the nerve of cavalry lies in its ability to use its weapons mounted. An infantryman with a horse, which he uses simply as a means of locomotion, is no more a cavalryman than he who goes to the battlefield in a buggy or on a railroad car.

In the struggles of horse and foot, we will see that a victorious infantry can seldom produce solid results, unless assisted by an excellent cavalry. Thus the great victories of the English long-bowmen gave no permanent advantages to the victors; the Swiss pikemen, though so often victorious, saved only their liberties, but did not discourage their enemies;

NAPOLEON'S victories at Bautzen and Ligny, supported by an inefficient cavalry, did not avert Elba or Saint Helena, as should have been expected. On the other hand, the proper use of a superior horse has made decisive the greatest victories of every age. There will be many drawn battles in future unless cavalry regains the prestige it has lost.

Cavalry has repeatedly met defeat at the hands of infantry, but up to 1870 it has been able to win back its old honors after each disaster. So the Roman legions were destroyed by the Numidian horse; the Turkish janizaries were routed by the cavalry of Tamerlane; the Grecian phalanx was broken by Roman cavalry; the Spanish infantry went down before the French dragoons. But cavalry is slow to recover from the blows received on the day of Sedan; there, upon the fields of Floing and Cazal, the best cavalry of Imperial France was ruined in an attempt to drive back the German skirmishers. At some places, indeed, the lines of skirmishers were broken through at the first onset, but the fire of the supports in all cases destroyed the force of the fierce charge.[1]

Let us reflect that cavalry is still armed with the weapons of barbarism or of chivalry, that the traditions of SEYDLITZ, of ZIETHEN, of MURAT are still accepted models for our ambition; that no great improvement has been made since the days when FREDERICK THE GREAT gave orders that any cavalryman should be shot who would receive a charge at a walk. Need we wonder, then, at this defeat by modern infantry, or that this defeat was so disastrous and final, or that the use of mounted cavalry against unbroken infantry is universally regarded as a vain and useless sacrifice? Who will say that cavalry can ever regain its former position without many vital changes?

Cavalry, for weapons, have either used the missile or the hand weapon. The most terrible horsemen of any age have been those who used the missile. JEREMIAH foretells the day when "the whole city shall flee for the noise of horsemen and bowmen."[2] The invention of the saddle is ascribed to the Persian mounted bowmen who thus increased the security of the seat.[3] The Scythian soldier overran the most powerful ancient monarchies. His favorite weapon was the bow, which he used as he rode, shooting his arrows with great precision.[4] RAWLINSON thus describes the Parthian cavalry: "It was carefully trained in the management of the horse and the bow, and was unequalled in the rapidity and dexterity of its movements. The archer delivered his arrows with as much precision and force in retreat as in advance, and was almost more feared when he retired than when he charged the foe."[5] Behold here a picture of a model cavalry

1. Official account. Part 1, page 375.
2. 29:4.
3. "Cavalry," by General DE PEYSTER United Service, Magazine, 1880.
4. RAWLINSON, Ancient Monarchies, Vol. I, page 494.
5. Same, Vol. III, page 227.

and I remember well that these horsemen often defeated the Roman troops —even the legions of the days of POMPEY and of CÆSAR. Since it has been established that the bow and arrow were among the weapons used by HANNIBAL'S Numidian cavalry,[1] it seems altogether probable from their character as troops, and the customs of their descendants that their favorite weapon was the missile. From the arrow to the bullet we skip two thousand years. To-day the Cossacks, the Khirgiz, the Bedouins, the Algerians, and the North American Indians are expert rifle shots on horseback. The next step is to the revolver. Far excelling any previous device for delivering a missile or a blow at the hands of a mounted man, it will surely bring honor to that race which first adapts it to the modern battlefield.

Before discussing the weapons to be used, it is desirable, of course, to conduct the cavalry so as to arrive in the best possible condition within the effective reach of its arms. The two points will then arise: first, closing with the enemy, second, avoiding or turning aside the missile of the enemy.

Twenty-five years ago charging cavalry could traverse the range of the infantry arm in less than forty seconds, during which infantry could fire two shots. Now the zone of fire is increased to twelve hundred yards and more. In the German cavalry at inspections the cavalry are now expected to make four or five miles at the trot and gallop and then to execute the charge in full career without getting blown or winded.[2] But still the cavalry may remain under the fire of the infantry for three minutes, during which the latter may fire fifteen shots. The adoption of a fire weapon by cavalry would probably be followed by a slight increase of interval. The relative merits of echelon formations and of successive open lines with closed supports would have to be tested.

The second consideration is how to avoid or turn aside the missile of the enemy. The various irregularities of the ground, the constantly diminishing range where our horseman rides under the trajectory, the moral effect of the charging mass upon that which is standing still, the active and aggressive action of the horse artillery; all these will tend to make ineffective the aimed fire of the infantry. But the missile which has been unerring in its flight and reaches the frail body of horse or man can only be turned aside by defensive armor.

Breast-plates are tested by placing them as targets at about seventy-five yards, at which distance they resisted the infantry bullet up to 1884. In service they would be effectual at less distances, and when on the body of a moving man the resisting and deflecting power would be still more increased. There is no doubt about their having saved many lives in the

1. HANNIBAL'S army in Italy, by General DE PEYSTER, United Service Magazine, 1880.
2. Letters sur la Cavallerie par le Prince KRAFT VON HOHENLOHE-INGELFINGEN, p. 73-4.

Franco-German war. The cuirass, consisting of front and back piece, the latter only capable of resisting the saber stroke, weighs from eight to eleven pounds according to size and is made of steel.

The alloys of aluminium deserve some notice here. The properties of the metal have only been known for about thirty years, since discovered by DEVILLE, and up to this day it has not become in general use owing to the expense of manufacture. This difficulty appears to have been largely overcome in the electric furnace so that the various grades of aluminium alloys are quoted at from sixteen to forty-five cents per pound. The properties of the metal are non-corrosive action, lightness, ductility; it is two and a half times heavier than water and is about as light as glass. So far it has been found that when more than ten per cent. of aluminium is used with copper the alloy becomes brittle; this grade has the lustre and color of gold. The latest government tests of this grade of aluminium bronze, hot rolled from a two inch billet to $\frac{3}{16}$ inch round bar are as follows:

Tensile strength 111,400 pounds per square inch.

Probable elastic limit 84,000 pounds per square inch.

Hardness 21.17.[1]

The average properties of 137 specimens of accepted gun steel, from hoops, jackets and tubes, oil tempered and annealed, U. S. Government tests, are as follows:

Tensile strength 96,150 pounds per square inch.

Elastic limit 51,611 pounds per square inch.

Hardness 21.4.[2]

The immense field of the alloys of aluminium has just been entered and we may only speculate as to the future and possibilities of this metal. But I think that enough is known to warrant the assertion that articles of defensive armor can be constructed, superior to and lighter than those in use, which will effectually protect against the infantry bullet, over a great portion of the zone of fire.

Eleven years ago in the last great European war the infantry bullet had attained immense power. A Russian general was killed by a Turkish bullet a mile in rear of the positions of his army in the Schipka Pass, men were picked off two miles in rear of the Pass, and were killed and wounded when sheltered by the brow of a ridge which rose thirty to fifty feet above them.[3] Balls after coming a mile entered the hard ground a distance of two feet, and a perpendicular distance of from six inches to one foot. One of these bullets would travel a mile and then go through a horse and

1. Aluminium Bronze for heavy guns. Proceedings of Naval Institute, page 662, Vol. XIII.

2. Page 606, same.

3. War Correspondence of *Daily News*, 1877, Vol. I. page 122.

any number of men who should happen to be in its line of march.[1] The fire arms of the next war will be still more deadly, and it seems strange that the subject of protection from this fire has not received more attention. The destructive effect of large guns forced the sailors to armor defense until they reached the very limit of its usefulness. Who knows but what we may build up to that limit on land? Whatever the future may be in this respect it seems to me that it is a more serious question for the cavalryman than for any other soldier. The infantry rifle is effective to such a great distance, it takes such a slight wound to place a man "out of the combat," the vital parts are protected by so delicate a casing, that the cavalryman should fairly be granted something of a protection while crossing the zone of fire powerless to reply to the enemy's bullets.

The cavalry having been conducted to the proximity of the enemy with a minimum of loss and a considerable reserve of energy, the next points for consideration are: first, the cavalryman's use of his weapons in delivering his blow, and second, as to his conduct after the shock.

It will be in considering the cavalryman's use of his arms that we must decide between the saber and the revolver.

It has been found that with the horse at speed six shots can be fired with deliberation and more or less accuracy while traversing a distance of seventy-five yards. No argument in favor of the saber can show that its effect extends beyond the reach of the sword arm of its owner.

Armed with the saber against an infantry armed with a breech-loader the most terrible part of the charging trooper is the horse. The saber is not feared; that weapon is hardly effective beyond the range of the horse's four feet as he thunders past; the foot-man is more apt to be struck by the horse than by the saber; the result of a collision with a running horse is more to be dreaded. This cool foot-soldier who now stands upon the skirmish line to receive the charging horse can at a few yards easily drop the rider who comes upon him, swinging his saber, thirty inches long, but he cannot stop the horse so well. The small calibers and heavy charges now adopted by infantry will enable an animal to travel a long distance and trample several infantrymen to death after he has received more than one mortal wound. At the battle of Beaumont, in 1870, the French Colonel DE CONTENSON with the 5th Cuirassiers charged the skirmishers of a portion of the 27th Prussian line regiment. DE CONTENSON fell mortally wounded within fifteen paces of the skirmish line, one of his non-commissioned officers was killed in attempting to saber the Prussian captain, those of the troopers who succeeded in running over the skirmish line were thoroughly defeated by the supports. The Prussian company gained its brilliant success without sacrifice; some of the fusiliers, run over or thrown down by the horses, had received such trifling contusions

1. Same. Vol. II, page 22.

that they remained with their battalion. On the other hand, the loss of the French regiment of cuirassiers in the charge amounted to eleven officers and upwards of one hundred men and a still larger number of horses.[1]

In the celebrated charge of the Dragoons of the Guard at Mars la Tour, their loss was 96 officers and men and 204 horses. Note again the loss of horses. Surely the horse in a charge becomes a projectile with great velocity and battering force. The infantryman must either stop him or get out of his way. "His neck," in the words of JOB, "is clothed with thunder; he rejoiceth in his strength, and goeth on to meet the armed men; he smelleth the battle from afar off, neither turneth he back from the sword." That is why so many horses are killed. Let us now substitute the revolver for the saber, and the effect of cavalry is at least doubled by the new element that enters the question. The skirmisher can no longer ignore the rider, the reach of whose terrible arm is now increased a hundred fold.

The saber is powerless against an attack on the left and left rear. The revolver can be used in either direction. The revolver stops the adversary with a single sledge-hammer blow, while a man may be covered with saber wounds and continue fighting. Instances of this kind are numerous. A good example was that of Colonel ALFRED STOWELL JONES, when a young officer, charging at the head of some lancers in the Indian mutiny. He received twenty-two saber cuts but did not give up his command.[2]

The revolver may disable the horse of your enemy, thus placing the rider "out of the combat."

With the revolver the rider sits squarely on his horse as he fires in every direction. To deliver a blow with a saber a trooper is apt to throw his center of gravity to one side — to lose his seat in fact. Every horseman knows the danger of a broken stirrup-strap, a shy, a jump, or a loose girth at such a moment. There is an immense difference between riding on a tanbark track and taking a run over an unknown bit of country. A man may swing his saber gracefully and effectively in a riding school, but it is different when you put a carbine-sling over his shoulder, fasten the carbine in its boot, surround his waist with a belt full of cartridges and build up the saddle in front and rear with articles of equipment.

The saber acts for but an instant — a cut, a flash, a point, and it is gone in the wild career of the charge. With the revolver twelve blows can be delivered — six before and six after the shock — to one blow delivered by the saber.

How long it takes to become a swordsman, especially with the horses

1. Official account. Page 276, part I.
2. The Cavalry of the British Army, by Captain SALUSBURY, United Service Magazine, 1881.

we get! The horse of the sabreur must be skilled in all the arts of the manege. The idea of ever obtaining such a cavalry must always be a wild, gay dream in this country. But you can jump on a broncho, put him at full speed and shoot just as well as if you were riding a thoroughbred. Thousands of such a cavalry could be put in shape for efficient use in this country while the gentlemen of the saber are drilling at cuts and parries in their riding schools.

JOMINI's testimony is that the lance, not the saber, is the weapon of the shock; that the saber is the arm of the melee. The revolver is at once the weapon of the headlong charge, the struggle and the rout.

The use of the revolver is not expensive. Practice in the manual and in the manner of delivering the blow is most necessary. The mysteries of "getting the drop" should be learned without using cartridges.

The fine nerves of the expert rifleman are not essential. A gentleman whose hand shakes with a peculiar muscular tremor told me that he became a close snap shot with the revolver, notwithstanding his affliction. The fine eyesight of the sharpshooter is not essential, for there are good snap shots who could never win the sharpshooter's badge.

Suppose we acknowledge the saber to be the best weapon in the clear field, without mud, rocks and ravines. What does it avail against an enemy up a tree, on the roof of a house, even on the other side of a fence or under the band-wagon?

Prince KRAFT DE HOHENLOHE-INGELFINGEN, in his "Letters about Cavalry," says: "The staff dared not advance the cavalry divisions alone into the heart of the hostile country where they would have been surrounded on all sides by francstireurs, national guards and newly formed bodies of troops."[1] That is a good deal from a Prussian Lieutenant-General. What but vital defects of armament could bring German cavalry to such an acknowledgment?

The friends of the saber say, "It is always loaded." We answer, "So is the revolver. If you don't believe it, let any revolver be pointed at you and see how it feels." Mortal courage is born of confidence What man will face the smoking muzzle of his enemy's revolver and not believe it contains a messenger of destruction that cannot be parried by any arts of the fencing school and riding track?

First-rate authorities on the subject of the charge and the melee have stated that there are only a certain number of men in any command who are ready and eager to come to blows. A very large proportion is carried along by the elan of the former; they may add to the weight of the charging mass; they may even be rash in pursuit but would never stem the tide of defeat; they are more anxious to avoid than to receive blows.

1. Page 79.

This class of men cannot be relied upon to close with an enemy in a death struggle on equal chances. Neither can another class, still less aggressive, who have no heart in the fight and who will run away if they get a chance. It has been urged by the saber men that a man is brave according to the length of his weapon. This fact renders ineffective a large number of sabers of moderately brave men, who would use a pistol at ten yards, but not a saber at one yard.

Then there is the logic of figures. During our last war there were treated 246,712 cases of wounds which could be identified as shot, saber or bayonet wounds. Of these 522 were inflicted by the saber, and of these "a large proportion had their origin in private quarrels or broils, or were inflicted by sentinels in the discharge of their duties"[1] The proportion of deaths from these wounds was only five per cent., which forbids the idea that the saber left its victims dead on the field. In the war of 1866 there were 481 saber and bayonet wounds in all — Prussians, Austrians, Bavarians and Italians. If the proportion of saber to bayonet wounds was the same as in our war, about 270 can be placed to the credit of the white weapon. In the war of 1870–71 there were 976 Germans wounded by the saber and bayonet, and by the same ratio about 450 of these would be due to the saber. There were six Germans killed by the saber stroke. In that war the Germans had seventy thousand cavalry in the field, and the great cavalry battle at Mars la Tour was fought between five thousand horse.

We are almost reminded of those battles of the fifteenth century, about which MACHIAVELLI tells.[2] If the white weapon can do no better than this in three wars, it is certain the revolver will do no worse.

We have next to consider the conduct of cavalry after the shock. After the shock the cavalryman with his present armament finds that he has not injured the line of the enemy; he cannot stay there because he is a creature of offense only and is ruined by inaction or in any position where he is placed in an attitude of defense. So he rides away again on his jaded horse and the trodden infantry gets up and blazes away in his back as he goes. With revolvers the story of cavalry riding over an infantry force without destroying it need not again be told. We will here find an answer to the question propounded elsewhere as to the cause of the futility of the modern cavalry charge. The cause is not to be found in excessive losses, because cavalry have often reached an enemy's line that was bristling with artillery and breech-loaders. The losses in the advance have been so mixed up with those of retreat that it is hard to determine them, but it is probable that no cavalry from Balaklava to Sedan have charged with greater losses than those of PICKETT at Gettys-

1. Medical and Surgical History of the War, Surgical Vol., page 686.
2. History of Florence.

burg or of SKOBELEFF in the Green Hills. It has been well established that the greatest losses to cavalry have occurred after the shocks and this is for the reasons given. Cavalry must be provided with reserves near at hand to encounter the supports of the enemy's first line. Extra revolvers or reloading devices equal to those of General KELTON, are indispensable.

When cavalry encounters cavalry its role will be more simple than when it acts against infantry and many of the conditions mentioned before will still exist. Here supposing the enemy to be advancing at an equal rate of speed it will not be advisable to fire six shots before crossing his line; one shot will be fired at about seventy-five yards, one at about thirty and one at about fifteen yards The revolver-armed rank, while still intact and all unanswered, delivers three staggering blows upon the hostile line, then follows up the last blow with the full weight of horse and rider. There are now three shots left, and a trooper who cannot hit a man or a horse at ten yards distance, within three months after his first mounted drill, is not fit for the high and honorable calling of a cavalry soldier.

Great ignorance exists about the revolver among military men everywhere. An English cavalry officer who has lately written a book on modern cavalry discusses most subjects intelligently but dismisses the revolver from consideration on the ground that a trooper will have to pull up his horse in order to deliver an accurate blow.

Colonel KEITH FRAZER, also an Englishman, says: "It is to be hoped that revolvers, which are far more dangerous to friend than foe in a charge, will never be supplied to our private dragoons." The same officer says that if the training of recruits, which in the English service is performed by the adjutant and riding-master, is performed instead by squadron officers, they "must expect less individual proficiency in the soldier." This last remark will perhaps explain the Colonel's alarm over the use of the revolver. We will freely acknowledge how terrible a weapon it is in careless and ignorant hands. In the campaign of 1876, two officers of my regiment were wounded by their own revolvers; in the next year another killed his horse; shortly afterward two men in a small command on a scout shot themselves accidentally. In those days the revolver was carried for no known reason and men who had worn it for years were often most clumsy in its use. Within the last four years I have repeatedly seen the revolver given to recruits as soon as they were only *fairly* proficient in the school of the soldier mounted, and never an accident occurred.

The text book on "Minor Tactics," by Colonel WILKINSON-SHAW, in use at the U. S. Infantry and Cavalry School at Fort Leavenworth, does not mention the revolver at all, thus ignoring the fact that some two hundred thousand revolvers are in use in the Russian army, and that as a weapon it has at least a fair war record in this country. The author

says: "His (the trooper's) arms should not be used from the saddle except for the purpose of signal. Dismounted cavalry can use their fire-arms effectually."[1] The inference of course is that mounted cavalry cannot use their fire-arms effectually. Colonel WILKINSON-SHAW'S remarks are taken from the Prussian regulations, and they give an average modern idea of the use of fire-arms by mounted cavalry.

Such ideas are common in our service as well as abroad. In answer to such criticisms I will give a few examples of the use of the revolver under various conditions; to show its quickness and sureness in the charge or melee as well as on foot; to show how it parries the stoutest blow or overhauls an enemy in retreat; and again to show its successful use by considerable bodies of men.

The guard of a railroad express car in Texas, opening the door of his car was confronted by a burglar who fired in his face. The guard drew his revolver and emptied the six shots into the burglar's body before the latter could fall or advance or fire a second shot. I was told this by the living actor and have reason to believe it to be true. In fact, it is no great feat to fire six shots with the Colt's single action service revolver in less than four seconds.

At Old Church, Virginia, in 1861, Captain, now Colonel, W. B. ROYALL, armed with a revolver, with two troops of the Fifth Cavalry, charged General STUART'S advance under Captain LATANE, who was armed with a saber. ROYALL and LATANE met in the headlong charge. LATANE was killed, but ROYALL was able to charge through the enemy and rejoined his command with six saber wounds.

At Solomon's Fork, Kansas Territory, in 1857, Lieutenant, afterwards General, J. E. B. STUART, with his saber, charged twice upon a single Indian who had a pistol. STUART was seriously wounded in the second attempt, and it took three officers and several troopers to kill that Indian finally.[2]

I borrow a few English examples:[3]

"At El Teb an Arab was cutting down one of our fellows, when a farrier shot him dead so clean that the sword just cut through the man's scalp, that was all."

"Captain BURN-MURDOCK, of the Royals, with his legs jammed under a dead camel, at Abu Klea, succeeded in killing four or five Arabs who attacked him while in this critical position."

"A troop sergeant major of the 10th Hussars, says: 'On charging the Soudanese at El Teb, I first attempted to cut them down with my sword, but found I could do little execution with it; the enemy for the

1. Page 21.
2. Campaign's of STUART'S Cavalry, by Major MCCLELLAN, p. —.
3. Revolvers and their use, by Major KITCHENER, Journal of Royal U. S. Inst., 1887.

most part eluding my blows, and even when struck, appearing to suffer little from them; I then drew my revolver and soon knocked over three or four.'"

The famous Colonel BURNABY was killed in a useless saber fight with a couple of Arab spearmen. He was a *beau ideal* cavalryman, and if he had used a pistol he would probably be living to-day.

The official report of General JOHN S. WHARTON, C. S. A., commanding two thousand cavalry at the battle of Stone's River, in 1863, says: "The proper weapon for cavalry has proved to be the revolver."[1] A number of Confederate generals have given similar opinions. Major THOMAS HARRISON, Texas Rangers, in his report of a reconnoissance on the day following Shiloh, says: "The front line of the enemy's infantry and his cavalry in its rear was put to flight; a portion of the latter only after a hand to hand engagement with the Rangers had attested their superior skill in the use and management of pistol and horse."[2] In this charge, the Confederate Colonel, afterwards Lieutenant-General, N. B. FORREST was wounded. General WM. T. SHERMAN'S reports confirm the flight of our men.[3]

I have purposely refrained from quoting a number of books written by Confederate cavalrymen or their friends. These writings have given most positive testimony in favor of the revolver, but I have preferred not to use them, fearing that their somewhat one-sided character might prevent a free and cordial discussion of this question. I will simply mention two instances of the use of the revolver, given in "Scott's Partisan Life with Mosby." The first is a fight at Myerstown, Virginia, on November 18, 1864, between a squadron of Federal cavalry under Captain R. BLAZER, 91st Ohio, and a detachment of Confederate cavalry, under Major RICHARDS. The Confederates, using revolvers, defeated the Federals with a loss of twenty-four killed, twelve wounded, and sixty-two prisoners and horses; and with a loss to themselves of one killed and one wounded. The statement of the Medical and Surgical History of the War is that the Federal loss was sixty and that the Confederate loss was ten, in killed, wounded and missing. Again there is a fight mentioned, one hundred on a side, where the Federal loss was twenty-six killed and wounded, and fifty-four prisoners and eighty horses; the Confederate loss, nothing. The nearest to a verification in the list of engagements in the Medical and Surgical History of the War is the action at Drainesville, Virginia, on February 22, 1864, between MOSBY'S men and a detachment of the 2d Massachusetts Cavalry, under Captain J. S. REED. The Federal loss is here given at ten killed, seven wounded and fifty-seven missing; the Confederate loss, two killed and four wounded.

1. Rebellion Records, Vol. XX, Part 1, Reports.
2. Same, Vol. X, Part 1, series 1.
3. Same.

Owing to the efforts of several officers and the enthusiasm of the infantry our army is now an army of marksmen — the best in the world. But as a result of it all, the ambitious trooper finds himself in an anomalous and mortifying position. Gold medals and high honors are prescribed for rifle firing, but the cavalryman's weapons are forbidden from military matches and competitions. No encouragement is given to the cavalryman who perfects himself in the use of his distinctive weapons, but his honors must be obtained with an infantry rifle; he must lie on his back with an infantry gun-sling strapped over his knee — his horse perchance a thousand miles away. This state of things is largely due to the indifference of our cavalrymen themselves. Unlike the troopers of every other land we are content to follow in the paths where the infantry have shown the way. If we had not accepted these methods as right and proper for our arm, we would long ago have had systems and matches and methods of our own. Unless we ourselves establish the fact that we have a part of our own to play and that we are able to assume it, it is probable that our country will discover that she does not need the expensive luxury of a cavalry, in numbers equal to one-fourth the peace establishment. Such an event has occurred within the memory of living cavalry officers.

The revolver is necessarily an officer's weapon. Of course no one would think of using the officer's sword in a scrimmage; it is but a badge of authority, almost as worthless for offense or defense as a field marshal's baton, which by the way is but a memory of the war club and mace. The officer finds it to be out of the question to carry a carbine or rifle, but he needs a far-reaching handy weapon with which he can enforce his orders or take a hand in any little fracas within a radius of a hundred yards at least. A case in point occurred during the Apache outbreak of 1872, in Arizona, when an officer at fifty yards, killed an Indian who was in the very act of knifing a soldier. Such an emergency may never occur in any of our lives, but it is the duty of every officer to keep himself prepared for the moment when his very best efforts will be called for. Thousands of men can throw a stone or a base-ball with accuracy who could not place a revolver bullet to save their lives — yet the muscular action and the practice required are about the same. The truth is that most people who carry a revolver are content with a knowledge of its power, without an idea as to the method of commanding that power for their own use. A revolver in such hands is about as awkward and dangerous a plaything as a locomotive engine would be in the hands of one ignorantly attempting to "run" it. Witness the Chicago police shooting into a crowd of anarchists at close revolver range, and the number of innocents in proportion to the number of anarchists hit. Witness similar cases in almost every daily paper. How often we hear of desperate encounters between individuals who empty their revolvers at each other at a couple of yards distance.

The revolver is far from perfect. General KELTON's improvements show where the greatest changes should be made. The uniformity in size of the stocks furnished with revolvers is a source of much trouble. Every man who has a revolver furnished him should have his hand fitted to the stock. General KELTON proposes radical changes in the shape of the stock, all perhaps in the right direction if we use the Smith and Wesson. I have always preferred a Colt; the stock whittled and filed so as to fit the hand and allow the thumb to be extended on the left of the hammer.

One of the hardest things to learn about the revolver is the manual of cocking the piece in rapid firing. General KELTON proposes to obviate this by some changes in the form of the hammer. Cowboys frequently file off the notch of the tumbler so that the full motion of cocking will not be necessary. The principle of rebounding locks, whereby the hammer would reach a full cock after each discharge, would settle the question, but some people would claim it would make the weapon too dangerous.

The Smith and Wesson has defects in the trigger pull, tempering of the small parts, recoil and complicated arrangement. I think expert shots in this country prefer the Colt for close shooting. The Colt perhaps possesses an excess of power. It has a penetration in white pine of two and a quarter inches at 300 yards—a penetration of one inch corresponding to a dangerous wound. Too great power of this kind would encourage firing at long distances and would diminish "stopping" power at short distances. "Stopping" power must not be measured by penetration. To get the former we must add to the mass and decrease the velocity of the bullet, but neither must be changed sufficiently to impair the accuracy. Hence we see a very delicate adjustment is necessary.

The multiball cartridge seems to have been condemned by the Ordnance Department on the grounds that it is no better than the single ball at distances up to twenty-five yards, and that it has not sufficient power at distances over seventy-five yards. The experiments gave excellent targets at seventy-five yards, a single cartridge doing the work of three so far as accuracy goes, with just the right amount of dispersion. At this distance it gave a penetration of about one inch in white pine. The Chief of Ordnance and the Board of Ordnance Officers do not regard these results as satisfactory, but whether on account of poor results at greater distances, I cannot determine. Certain it is that seventy-five yards is the limit at which the revolver should be used by a mounted man, and all experiments should be conducted with the view of making the cartridge efficient within that range. While the dispersion of the multiball cartridge is hardly to be noticed at twenty-five yards, this very fact may

make it of great service to us. It seems probable that the battering effect of three bullets in the same place will be immensely greater than that of a single larger bullet, while the penetration and deadly effect will not be so great.

At twenty-five yards our missile must positively "stop" an adversary; no man with a mortal wound must be allowed to kill several enemies before he succumbs, as is frequently the case when small caliber revolvers are used. The English on this account distrust even our American revolvers. A large number of their officers use great double-barrelled pistols, horse-pistols, four-barrelled derringers and the like, with an express bullet. The four-barrelled Wilkenson, we are assured by Major KITCHENER, would drop an ox. I do not know of any measure of stopping power that has been adopted, but a different measure of efficiency with rifles and revolvers is necessary. In old days it was no great feat to knock over a buffalo with your Colt's revolver, so I would judge it to be satisfactory in that regard. Good results with the Colt's barrel shortened two inches, the round, soft ball and smaller charge, can be obtained up to fifty yards. These are well-known expedients, adopted by experts who are liable to have use for their weapons at close quarters.

A report by General JOHN C. KELTON, in 1881, gives some results as follows: "Eight men out of three companies in the division made sixty-three, seventy-four and ninety per cent. of hits with the pistol at the gallop; six shots advancing from one hundred yards, and, reloading, six shots in retreat, in one minute and fifteen seconds." "The best individual score with the pistol mounted, firing six shots approaching at the gallop between one hundred yards and ten yards of the target, then reloading and firing six shots in retreat at the gallop was seventy-two per cent., and of hits ninety-five per cent." These results were obtained after ten day's practice.

The remarkable exploits of cowboys with the revolver are well known — such amusements, for instance, as knocking off insulators from telegraph poles while running by. The shooting of the celebrated Lieutenant TURNER, of the 10th Cavalry, is often mentioned in the army. This man, with a pistol in each hand, and without looking at his sights, would write his initials in bullet holes at ten paces. Such, with the other deeds of dueling days, and the later attainments of CARVER and BOGARDUS, as snap shots, show the wonderful proficiency that can be reached with such a weapon as the revolver.

Marshal SAXE is credited with saying that: "Military men of all others, are the most tenacious of existing follies, and most averse to change." Reading the story of cavalry, its triumps and defeats, we realize how true the solid old marshal's maxim was. We then see how often great military successes have followed the greatest innovations; we

remember with what disgust the first use of "villainous saltpeter" was received; we smile at the arguments offered only twenty-two years ago against the breech-loader, and we notice the great similarity between these arguments and those now advanced against the revolver.

It will soon be acknowledged that the cavalry of to-day is handicapped by its arms as much as were the iron-clad knights at Cressy by their armor. Here in our country we have broken so often with the hard and fast rules of war on sea and land, we have so few of venerable memories to retard our progress, and we respect so little the moth-eaten and rusty beside the original and new, that the future of the man on horseback is brighter here than elsewhere. Now, the question is, whether upon the ruins of old tactics, arms and organizations, a new cavalry will be raised, proud of old traditions, though discarding them, ready and able to be "in fortune's cap" the very feather.

DISCUSSION.

By Captain C. C. C. Carr.

Judging from the papers by Captain Hall and Lieutenant Swift on the substitution of the revolver for the saber, it would seem that the advocates of this radical change in the armament of the cavalry are thoroughly convinced, in their own minds at least, of the advisability, necessity even, of making the proposed change.

While I recognize the zeal and ability with which the special plea for the revolver has been made, yet I feel compelled to say that I do not think the arguments and instances by which it has been supported are such as to carry conviction to the mind of anyone conversant with the history of the cavalry arm.

Had we been furnished with one solitary example of a case in which well-organized, instructed and disciplined cavalry, relying upon the saber alone, had been defeated and routed by one its equal in every other respect, but depending upon the revolver for its success, we should feel more confidence in the asserted superiority of fire arms to cold steel in mounted action. Not only has no instance of this kind been given us, but we venture to assert that not one such can be found in the history of modern wars.

If ever the revolver had a fair trial it was during our late Civil War, when it was in the hands of men who were more familiar with its uses than any other people in the world. While our cavalry was uninstructed and inexperienced the revolver may have been a favorite weapon, but no sooner had our mounted troops begun to learn the use and value of the saber as a charging weapon than the revolver fell into contempt and disuse. The saber not only established its superiority to the revolver in a hundred contests between mounted troops, but finally enabled our cavalry to ride down unbroken lines of infantry, as at Winchester in 1864.

In all well-disciplined volunteer regiments, in the last two and a half years of our war, the orders against attempts to employ the revolver in a charge were almost as strict as those given by Frederick the Great to his cavalry, and they required no special efforts for their enforcement, but were cheerfully obeyed, because it was seen by everyone that upon obedience to them depended all their hopes of success.

That the affair at Old Church instanced as an example of the successful employment of the revolver may admit of a very different construction is shown by the following extract from "McClellan's Life of Stuart": "The charge was made in column of fours and with the saber. It was received by the enemy standing in line, drawn up in the road and on either side of it, and with an almost harmless discharge of their pistols, Captain Latane and Cap-

tain ROYALL met hand to hand; the one with saber, the other with pistol, and LATANE received instant death. ROYALL was severely wounded by LATANE'S saber and by the men who charged close by LATANE'S side, and his squadrons were driven into hurried flight. The discipline of the regular service, however, asserted itself, and within a few hundred yards the Federal cavalry wheeled into line in beautiful order, again to receive and again to be broken by the charge of Co. E. A second halt was attended by the same result." It seems to be admitted that the contending forces engaged in this affair were about equal in numbers, and it appears, according to General LEE'S official report, that Captain LATANE was the only person killed in STUART'S command during the celebrated raid around the Army of the Potomac.

When it is remembered that Captain ROYALL'S command was cavalry of the regular army and contained in its ranks a large proportion of old soldiers, well drilled and disciplined, as shown by the account given; that they were armed with revolvers that could deliver six shots as accurately and as rapidly as those now in the hands of our troops; that they were charged and driven from the field, not only once but twice, by sabers in the hands of men taken from civil pursuits only a few months before, but who were good horsemen, we are justified in asserting that the employment of the revolver, instead of the saber, was not only a failure but a disastrous one in every respect.

Had the saber been used we have every reason to believe, considering the character of the troops engaged, the outcome would have been entirely different. The killing of Captain LATANE certainly did not affect the general result, unless by increasing the ardor of his troops, and Captain ROYALL probably owed his escape from death on the field to the sentimental prejudice which existed at that time against the use of sharpened sabers.

As to the wonderful feats of BILL ANDERSON and his Border Ruffians when attacking a body of so-called cavalry, granting the stories to be true, they prove nothing more perhaps, than that they pounced upon a body of men, whose only right to the name of cavalry rested upon the fact that they had horses and were designated upon muster rolls as cavalry. It is extremely probable that they had never worn a saber, or if they had, possessed no knowledge of its use or power; and that, all things considered, ANDERSON might have saved his cartridges and have captured the whole body by taking measures to prevent their dismounting to fight, had he not been inflamed with a desire to "make a killing" of his ante bellum, Free Soil enemies.

We know of similar reputations for dash and destructiveness, made by certain other men farther east, whose only weapons were pistols, who were careful to attack only bodies of raw recruits, or soldiers straggling from their commands, but were prudent enough to keep always at a safe distance from disciplined troops, if possible. The lessons they learned once or twice by accidentally running foul of regular cavalry were never forgotten by the survivors.

The Cossacks and other semi-civilized troops may be expert in the use of fire-arms on horseback at exhibition drills in time of peace, but we have no proofs of the destructive effect of their practice in war; while we do know what a terror the Cossacks have always been, even to the best of troops, when armed with the lance.

So late as 1878, a body of Circassian cavalry, magnificent horsemen and splendid swordsmen, having been armed with rifles and revolvers, to be used on horseback when attacked by the enemy, stood on the defensive until the last man was killed or captured. Having lost all their aggressiveness with their sabers, they never made an attempt to break through the surrounding forces, an attempt which might have resulted in the escape of many of them had they possessed their former weapons.

The American Indians who are classed with the expert users of fire-arms on horseback, would, so long as they remained mounted, inspire little fear in the minds of well drilled and disciplined cavalry, meeting them upon an open plain and attacking them vigorously with the saber, sharpened to a razor edge and needle point. For, it will be admitted by those whose experience would enable them to judge, that the Sioux Indian, on horseback, attempting to use fire-arms, is about as absurd an exhibition of the useless waste of energy and ammunition as could be well imagined. To ride round upon an open plain, lie over on the side of a pony and discharge a magazine rifle into the air, may be interesting as an exhibition of the Wild West order, but can hardly be considered effective work from a military point of view.

It is hardly reasonable to doubt that had our plains Indians been fought when they first became hostile, with the sharpened saber in the hands of thoroughly trained cavalry, lasting peace would have come years before it was brought about by the tactics we have pursued.

Perhaps we should have been spared the memory of the great disaster upon the Little Big Horn had General CUSTER brought his whole command, in fresh condition, with sharpened sabers, to the south end of the Indian camp and charged home, across the level plain, upon the seething mass of men, women, children and ponies, displaying all the confusion incident to the moving of so large a camp. Undoubtedly there would have been peace upon the banks

of the Little Big Horn. Whatever resistance the Indians might have made after such an attack would have occurred at a point far enough away from that spot to admit of their rallying after their dispersion and demoralization.

The several instances of fruitless charges made by different bodies of French cavalry in 1870–71 instead of shaking the confidence of believers in the effectiveness of the saber have only led them to deplore the folly or desperation of the commanders who insisted upon employing cavalry under circumstances condemned by all whose opinions on such a subject are entitled to respect.

If the "proud cavalry of Imperial France went down upon the fields of Floing and Cazal" it will be observed that the infantry, artillery and everything else comprising that part of the French army did not tarry long in surrendering upon the adjoining field of Sedan.

The charging of masses of cavalry over fields filled with stumps, intersected by ditches and enclosed by hedges, upon massed battalions of German infantry lying in security in other ditches and behind other hedges, upon the crest of hills so steep that the infantry had difficulty in attaining their summits, shows only that either the superior command had fallen upon shoulders unfit to bear it, or that the condition of affairs was so utterly hopeless that the destruction of a part of the army was considered less inglorious than continued inaction would be. Even under these unfortunate conditions the French cavalry did reach and pass the eight gun battery. What they might have done had they been properly supported must, of course, remain a matter of conjecture, with the doubt in favor of, at least, the temporary advantage of the cavalry.

"The cavalry in this charge (Mars-la-Tour) came close to the Prussians and without great loss, when it was completely disordered by the numerous obstacles strewn on the ground, biscuit cases, baggage wagons, and camp equipment, hurriedly abandoned by the troops in their retreat." In this charge which failed disastrously the want of success was due to two things: first, the German infantry had not been shaken by artillery fire, and second, that the ground had not been examined previous to the ordering of the charge.

The object in referring to these incidents is to show that the failures of the charges made by the French cavalry were due to something more than the fact that they relied upon the saber and lance for the accomplishment of their object.

We have been led to infer that had they been armed with revolvers and known how to use them, their enterprises would have been generally, if not always, successful.

To this it may be answered that it is extremely doubtful that the morale engendered by dependence upon the revolver would have admitted of such gallant attempts being made at all, even in obedience to positive orders.

The habit acquired by fighting with a weapon which permits the wielder to stand off any great distance from his enemy is calculated to foster an antipathy to coming to close quarters which has often resulted in disaster heretofore and will be likely to do so again.

Viewed from the standpoint of the opponents of the saber, its effective range may be only four and one-half feet but its friends think it is limited by exactly the strength of the morale which governs its action. This morale, although not capable of being measured by rule or weighed by balances has, on hundreds of battlefields, enabled the saber to decide the victory or ward off impending destruction.

Nor is the power of the saber to be measured by the number of its victims, as though a general massacre of the enemy was the only criterion of success in a cavalry charge, but rather by the effect produced upon those who survive its destroying power, that has rendered it so effective a weapon in worthy hands.

Dead men tell no tales, but a thousand panic striken fugitives justifying by their exaggeration of the enemy's prowess their own flight from the field, may diffuse throughout a whole army a feeling of terror that may lead to its dissolution or capture.

If, in the Franco-Prussian war only two per cent. of the casualties were due to the saber and lance we have the comfort of knowing that only about five per cent. were attributable to the artillery. But, while the cavalry took part in very few battles, the artillery played an unusually prominent part in every action great and small that occurred, but we hear nothing about guaging its effectiveness by the number of its victims.

Since the close of our Civil War we have but one instance of good cavalry attempting to charge with the revolver, and that was in the war of 1866. A Prussian lancer regiment in column of fours, formed squadrons successively, as fast as they could get off of the road, and not completely formed, charged an Austrian lancer regiment drawn up in line. The Austrians advanced in line and received the shock with a volley of pistol shots, but were instantly broken, and after a hand to hand struggle lasting some minutes, routed by the Prussians, who held the field, notwithstanding they had suffered slightly greater losses than the Austrians. The morale that accompanied the saber triumphed as usual.

We know how FREDERICK THE GREAT'S military career came near terminating with his first battle, on account of his being carried off by the panic which seized upon his cavalry after they had been charged and defeated by the Austrians.

As an instance of the results obtained by cavalry properly employed, which did not depend upon the number of killed and wounded, take the affair at Meddelin, in 1809. The victorious Spanish army in full pursuit of the defeated French under Marshal VICTOR, was turned upon by only five regiments of dragoons and cavalry, and in less than five minutes the whole Spanish force became a disorganized mass, fleeing in all directions, with the loss of all their artillery and eleven thousand men.

At Fére Champenoise, in 1814, Marshal MARMONT'S whole army, horse, foot and artillery, were defeated by the combined Russian and Austrian cavalry, who used only their lances and sabers.

Who will say that exploits rivaling these may not be performed by cavalry in the future, in spite of the breech-loader, if it be employed at the right moment and on favorable ground, instead of being sacrificed in making useless frontal attacks upon unshaken lines of infantry, as it was in the Franco-Prussian war.

Future wars may sometimes require cavalry to be employed as VON BREDOW'S six squadrons were at Mars-la-Tour, to hold an enemy in check, by a timely charge, until reinforcements can arrive. Much has been written about the losses in VON BREDOW'S command on that occasion. True the casualties amounted to about three-fourths of his whole command, but they were not due to the breech-loading rifle or cannon either, but to the counter charges made upon his blown and exhausted command, by fresh cavalry, who made up their "butcher bills" with lance and saber, as VON BREDOW had no supports to come to his relief.

His charge covered a distance of about three thousand paces, passed through the French artillery and infantry, the latter not having time to fire a second shot from their breech-loaders, so impetuous was the charge, forced the reserve artillery to limber up, and then returned to his starting point, pursued by French cavalry, with the remnant of his command, two squadrons of which were again ready for duty that same afternoon.

"It is quite certain that the sacrifice demanded from the cavalry in a most critical moment of the engagement was repaid by the complete success of the manœuvre.

"For the fatal attack of the French 6th Corps against the left wing of BRUDDENBROCK'S division was completely checked and never resumed, a proof how much the French troops were shaken by the vehement attacks of a few Prussian squadrons." (BORBSTAEDT.) As an additional result BAZAINE'S retreat was entirely cut off and his force shut up in Metz to remain there until surrendered. Perhaps no more gallant charge was ever made, and but few more important in their results. These six squadrons, charging without due preparation, and without reserves or supports, enabled the German commander with one corps to hold his position against an army of one hundred and eighty thousand men.

The habit of depending upon the saber alone inspires in the trooper a dash and spirit of aggressiveness that comes from the use of no other weapon, unless it be the lance. With the saber in hand the trooper moves forward to the attack knowing that to make any use of it he must get within arm's length of the opposing foe. There can be no halting short of that point, unless to turn and flee. It is human nature to relieve suspense by action, though it may lead straight "down to dusty death." During the slow gaits preparatory to the charge each trooper is on the alert waiting for the signal that indicates increased pace, until, finally, the charge is sounded. Then, with horse at highest speed, every faculty strained, and wild with the fury of excitement, the trooper rushes on and closes with his foe. The effective range of his saber has been attained, and, if he has learned his art, and plies it well, his enemy goes down before him or flees for safety and leaves him master of the field.

No tactics have been yet devised or suggested by which any large force of cavalry using revolvers can charge another, and it is very doubtful that it can be done. For any cavalry to charge successfully the officer must lead it, not get in rear to encourage or drive it. Troop leading is essentially the duty of the cavalry officer. Over rough country, every change of direction made by the commanding officer of a regiment or troop should be conformed to by the command at once without waiting for orders. To permit this to be done the officers must be well to the front where they can be seen. Now, the question arises, can they occupy their position while all the men behind them are holding loaded and cocked revolvers in their hands? I think not. Again, all officers of experience know how difficult it is to preserve, or attempt to preserve, strict fire discipline in the ranks of infantry, and will understand why it would be a hundred fold more difficult, if not impossible, in charging, revolver in hand. The accidental or premature discharge of one revolver would probably lead to a general fusilade along the whole line, as, in the excitement of the moment it would possibly be assumed that the order to commence firing had been given but not heard.

Even with the improvements already made in pistols, such as General KELTON'S and others that may be made in the future, the difficulty of rendering safe the action of revolvers on any extended front of a charging body will make the presence of officers in the position now assigned them, and which are the only ones they should occupy in a charge, utterly impracticable.

With a want of proper fire discipline the charging cavalry might arrive in the midst of the enemy's ranks with empty revolvers. By another one of General KELTON'S devices the pistol can be recharged with six cartridges in a moment, but that one moment, when both hands were engaged, might prove a critical one, and offer the enemy an opportunity of deciding the contest with the saber.

I am prepared to admit that a good revolver in skilful hands may be an exceedingly valuable weapon for the trooper under many circumstances. That it is the deadly, infallible instrument of destruction that it is claimed to be by its admirers and advocates; "That any recruit who cannot hit with it an object the size of a man, at ten yards, three months after he has taken his first lesson in riding, is not fit for the high and honorable calling of a cavalry soldier," I emphatically deny.

My own experience with the revolver, which has been rather extensive, in mounted and dismounted practice would not support such extravagant assertions. I have seen many good revolver shots developed on the target range when all the conditions were favorable; when there was no such excitement as would attend a charge; no flying projectiles and no opposing cavalry coming thundering down with the evident intention of staying long enough to make its mark. Even snap shooting, under such conditions, is very different from keeping up the "petulant pop of the pistol," when directed upon the face of a non-resisting target.

In considering the question of the ease with which skill in handling the revolver is acquired, fortunately we are able to get out of the realm of theory into the domain of solid facts. In the annual target report of the Department of the Missouri for 1887 we find the following results, the best that have been obtained in mounted pistol practice during the year; firing done at the gallop:

At 10 yards,	70	per cent.;	30	men firing.	
" 15	"	17	"	46	"
" 20	"	54	"	25	"
" 25	"	49	"	35	"
" 30	"	52	"	37	"

Now when we remember that the best shooting represented above has been made under the direction and training of officers who are themselves expert snap shots, who have employed every incentive possible to encourage their men, even to the extent of offering prizes provided at their own expense, we may well ask why have not better results been obtained if the art of accurate shooting with the revolver is so easily acquired that a recruit can learn in three months to hit his man every time at ten yards." As only one-half or three-fourths of the men of the troop have apparently been engaged in this practice, and that individually, not in rank, what are we to think of the remainder who are presumably much inferior in skill to those reported?

I believe in the utility of the revolver as a fighting weapon when employed in its proper sphere, that is, by individuals, by small parties of cavalry when open order fighting is made necessary by the nature of the ground, and I am willing to advocate its adoption as a charging weapon for large bodies when it has been demonstrated that it can be advantageously substituted for the saber, and tactics have been devised which will admit of its being safely and successfully employed, but as neither of these has been done yet, so far as I know, I prefer to abide for the present by the saber, which has never yet failed in the hands of those who have had the courage and the skill to use it properly, and have placed in it the confidence it has always deserved.

The employment of the breech-loader has, by compelling infantry to fight in loose order, given to good cavalry opportunities it has never had before when squares could be formed to resist it.

According to Field Marshal VON MOLTKE, "In modern warfare the long range and destructive fire of artillery necessitates a scattered formation. There will be more frequent opportunities for those brilliant dashes of small bodies of cavalry, in which, by taking advantage of the critical moment, the cavalry of division so often distinguish themselves."

HOME, in his "Précis of Modern Tactics," seems never to have considered for a moment the possibility of cavalry using fire arms in mounted action, and yet he writes as follows:

"The action of cavalry on the actual battle-field is by no means a thing of the past. The

use of cavalry with skill at the right moment and in the right numbers has always been considered one of the most difficult problems in war; modern arms have increased this difficulty many fold, but to say that the age of cavalry on the battlefield is past is merely another way of saying that the knowledge of how it should be used is wanting."

BY LIEUTENANT EBEN SWIFT.

MR. PRESIDENT: I think Captain CARR is mistaken in putting the casualties of the saber at two per cent. of the losses in the Franco-German war. According to the best information I have, that figure would be a little over one hundredth of one per cent.

My statement of the incident at Old Church was derived from a conversation with Colonel ROYALL himself, a few months ago. The fight at Cyerwenhood (Trauteuran) can hardly be cited in this discussion of sabers and revolvers, for several reasons: It was a victory of the Prussian lance and not of the saber. The Austrian commander "received" the mounted charge, and thus violated all rule and precedent. The Austrians did not use revolvers at all, but single-barreled, muzzle-loading horse pistols.

As to the remainder of this argument, I am satisfied to let it rest where it is.

BY LIEUTENANT EGGLESTON.

MR. PRESIDENT: The members of the Association will be greatly interested in reading Mr. SWIFT'S valuable paper in the JOURNAL, as we have been interested and entertained in hearing it read here. The query raised by the title, "Pistol or Saber," suggested at once, to my mind, the line of discussion which I thought the gentleman would pursue: First, the assumption that the cavalry should be armed with but one of these weapons; secondly, an argument intended to demonstrate that the saber as a cavalry weapon is obsolete and valueless and that the revolver is *par excellence* the arm of the mounted service in modern warfare. He has endeavored to strengthen his position in the discovery and illustration of a seeming antagonism between these two weapons. To obtain a greater prominence for the revolver, which we already have in our service, he disparages and would banish from our hands the saber which has been traditionally and is to-day the most popular and esteemed weapon with the cavalry throughout the civilized world. It is with respect to this feature of his argument that I would make a criticism. In my opinion these two arms are natural allies as cavalry weapons, and while I am pleased to note the merits of the revolver, which the gentleman has so well presented, and of which I am an advocate, I would retain the saber and associate the revolver with it. Indeed, I would retain all our arms, the saber, the revolver and the carbine. Considering the duties that must certainly fall to our cavalry in the event of a war again in this country, the greatness of our territory, its physical features, and the temper of our people, I believe these three weapons are necessary to the cavalry, that it may act in the dual capacity of cavalry proper and mounted riflemen. Our arm has been successful in this dual capacity heretofore, and I am quite certain, that there is a very great number of cavalry officers in our service, perhaps a majority, who are opposed to any change in the present armament, further than the substitution of a magazine carbine for the Springfield and the adoption of an improved revolver, neither the Colts nor the Schofield, Smith & Wesson giving entire satisfaction. The pistol has been associated with the saber as a cavalry weapon since the time of HENRY VIII, who gave his cavalry a pistol of rude mechanism, known as the "dag." Although a revolver was made as early as the middle of the 17th century, it is remarkable that no really good and serviceable revolver was ever produced until the time of our Colt in this century, and yet during all this time, the pistol was esteemed as distinctively the cavalryman's weapon. The *revolver* it will be observed, as compared with the carbine and the saber is one of the very latest of cavalry weapons, and in view of the conservatism displayed with respect to military armament, we should not be surprised perhaps, that in the wars of a quarter of a century only, our Rebellion and the three European wars, it has not gained real importance as a cavalry weapon.

Now, that we have the improved revolver which will kill at 300 yards and may be fired eighteen times in about two minutes — that is three rounds loaded and fired — there are cavalry officers, who, without fair trial, would discard it and arm our troopers with the saber and carbine; indeed not a few would take away both the saber and revolver making us simply mounted infantry. Those with whom the pistol is not in favor, assert that it is more danger-

ous to friend than foe. I remember reading an article by a cavalry officer, in which he stated the pistol should never be used in a charge, "for when a horseman like CUSTER could shoot his own horse through the head in a simple buffalo chase, what could be expected of the average cavalryman in the excitement of the charge." I had not heard of this incident before in the life of this gallant cavalryman, but I do know that he greatly esteemed both the saber and revolver as cavalry weapons. It was certainly a mere accident, and as futile for the purpose intended in its citation as it would be for me to attempt to demonstrate that the rifle is not a suitable weapon for infantry because some poor soldier had accidentally shot himself through the head, instances of which could be readily given. Officers opposed to the saber assert that it is a useless burden. Some of them have delved into the surgical history of the Rebellion to present a meagre data of the number of saber wounds treated by our surgeons. I have seen one explanation of the meagreness of the number of wounds reported as inflicted by the saber in that war, to the effect that the sabers on both sides were generally dull, and that a vast number of the wounds, except those made by the thrust, were bruises resulting from blows sufficient to knock a man off his horse. I presume these were recorded as contusions. Perhaps some of our "associate" medical officers will be pleased to enlighten us as to this. But we do not care to contend with this style of argument. We point to the grand results achieved. The surgical history does not show the number killed by the saber, nor the number knocked off their horses, ridden down and trampled to death in the many charges made on both sides—nor the number of prisoners captured.

It was in this war that cavalry operations were projected and carried out on a scale and to an extent which was before unknown, and, "in which," says Colonel TRENCH, "it was first shown to the military world what great and important results could, in modern warfare, be obtained by these bold and swiftly executed operations of cavalry." There was hardly any use to which cavalry was put, that, if successful at all, it did not accomplish most signal and decisive results. Captain LUMLEY, in a lecture before the British Royal Service Institution, a few years ago, stated that "it would be an injustice to cavalry to call the levies raised on both sides during our war by any other name than mounted infantry, but a later expression of approval and recognition of our cavalry comes to us from a more influential authority in the English service. I learn from this same authority that there has been for some years past an influential section of Russian officers, who have been urging the theory that European cavalry, drilled after the old fashioned methods, is unsuited to the requirements of modern warfare, and who insist that the model and example which should be taken, both as to armament and the method of fighting is the American cavalry of our civil war. It is quite certain that European military writers within the past three or four years have found more to notice in the history of the operations of that cavalry than at any former period. What was the armament of this cavalry and how did it fight? *It was armed with the saber and revolver*, and generally the carbine also. This equipped it for its dual function. Its power as an auxiliary to the infantry was greatly increased, it could fight either mounted or dismounted, could operate independently without the protection of the infantry, as it can now, and its independence thus made possible, presented strategic aspects and results which the military genius of that martial people, the Russians, have alone appeared to appreciate fully. In her next war we may expect to see some grand cavalry operations, some great raids performed according to the tactics of America which are so well suited to her enormous mounted force, and the immensity of the territory which will probably comprise the field of operations.

In the limited time to which these discussions must necessarily be restricted, I cannot illustrate, as I would wish, how the sabre, the pistol and the carbine were used by our cavalry in the many combats of the late war, the saber and pistol in mounted and the carbine and pistol in dismounted actions. They acted with boldness and skill in both mounted and dismounted contests, using these three weapons as best suited the conditions of the combat. I shall refer first to some noted leaders on the Confederate side, where the pistol from the first seemed to be a favorite weapon with their cavalry. It will hardly be denied that the mounted force under General MORGAN would have been a formidable cavalry detachment operating in a war with any country in the world. It certainly gave us much trouble. It consisted of about 5,000 men, mostly intelligent volunteers from Kentucky. These men carried a rifle with a bayonet, and one or more revolvers, usually as many of the latter as possible. Two companies—troops—were always told off to fight on horseback. They carried the saber. In dismounted action when MORGAN'S men got in close range, it was the invariable custom to use the revolver. Another cavalry officer of greater renown was General FORREST. His men were armed with a saber attached to the saddle, a revolver and carbine. When he attacked cavalry his advance would sustain the fight for a certain time and then feign a retreat, in order to draw on the enemy and encourage him to follow up. The latter was frequently drawn on till he was assailed at point-blank range by the next line who had dismounted and placed them-

selves in ambush. I think it is probable the Prussians learned this ruse from us, which they practiced in their last war with Austria.

It is stated that FORREST charged at the battle of Shiloh with the revolver, that being his favorite weapon. Another distinguished cavalry leader of the Confederates was General STUART, a regular-bred soldier. I need not mention his daring feats, riding around the Union armies and his bold operations in Pennsylvania. I have the authority of a very careful writer that his men were armed with both the saber and revolver, and that very few of them at first had carbines. When he made the circuit of MCCLELLAN'S army in '62 he had 2,500 men. In 1863 he had 12,000 horsemen. Colonel TRENCH says: "SHERIDAN had 10,000 horsemen under his command armed with the saber, the revolver and the Spencer." "They only fought on horseback against cavalry, and then *charged, sword in hand.*" As a general rule Confederate horsemen did not wait mounted to meet them, but hastened to dismount and get under cover, using their carbines. When they had no time to execute the manœuvre they made use of their revolvers. In some of these actions the Federals are said to have found to their cost that this weapon was more deadly than the saber. There is scarcely any ground within the districts of active operations which the cavalry, armed with the saber and the revolver, and commonly the carbine also, did not charge over time and again.

The use of the revolver has not been restricted to the mounted fire action of cavalry. In the dismounted action of cavalry where, for example, it is used to aid infantry in enveloping a flank, or where it is required to seize an important tactical point to be held until the infantry can reach the ground, the revolver, in my opinion, becomes a most important and effective auxiliary to the carbine. I assume that the action would take the form of the modern battle tactics. In the final rush what more formidable and death-dealing weapon could be placed in the hands of an assailant skilled in its use. This was the use of it made by MORGAN'S men, at times, to which I have adverted. I think Colonel KELTON, of the Adjutant-General's Department, has given the best description of how a pistol should be fired that I have ever seen. He says, "Snap firing is the only kind which men mounted can adopt with advantage." "In firing the eye must see the object and the pistol projected at it and fired, with the same motion and rapidity that a missile is thrown from the hand." "The bullet should leave the pistol just as the thrown missile does the hand; the object at which the projectile is thrown being alone noticed." All the mounted expert pistol shots I have ever seen in the west fire the pistol in this way. Any young trooper of fair intelligence and sufficient aptitude for the cavalry service can be taught an efficient use of the pistol in this manner. Indeed, in the heat of battle "snap shooting" is that practiced with the other fire arms. I do not suppose it will be disputed that the pistol is an appropriate and convenient arm for signaling in outpost duty and for personal defense.

It is said the sword is straightforward and ingenuous. So is the pistol. Its action is like that of the "blow" with the saber; the antagonist is seen. The same type of fortitude, the same passion and impetuosity are moved in the *melee* with the pistol as with the saber, though perhaps in a less degree.

It is the only fire arm placed in the hands of the cavalryman which does not injuriously affect the *morale* inspired by the saber combat. The striking characteristic of the form of action of both these weapons is *personal*, hence these weapons are naturally and appropriately the arms for cavalry. Take away the saber, and cavalry loses much of its dexterity, its intrepidity and its real power. Take away both the saber and pistol and you have a body of horsemen in which there is no action, no dash and no movement, not toward the enemy in any event. The shock action is obliterated from the tactics. You have a force of only fairly good infantry afoot and, mounted, one that is incapable of offensive or defensive action, physically weak, morally contemptible and afraid to ride at the enemy; it should never be accorded the name of cavalry.

Austrian cavalry carry the saber and carbine and part of the mounted force is armed with the pistol. The French cuirassier carries both the saber and pistol.

The saber is in the hand of every German cavalryman and the whole of the mounted force of Russia is armed with this weapon. They carry the carbine also. When it is proven that we cannot enlist men in this country capable of being taught the skilful use of the saber, and a practical, if not expert, use of the revolver, then it will be time enough to heed the arguments of those officers who claim that both are useless, and allowing that they do possess some value, that we are incompetent to learn to fight with either—a view directly opposed to the teachings of our last war. It may happen in time that the pistol may be substituted for the saber. Of this I am doubtful. It certainly would not be wise to do it now. As I have said, I would keep the three weapons. We yet have a lighter equipment and armament combined than that of any European cavalry.

DEVICES BY MEANS OF WHICH EFFECTIVE MOUNTED FIRING WITH THE PISTOL AND CARBINE CAN BE OBTAINED BY THE CAVALRY IN ATTACK.

By COLONEL J. C. KELTON.

Assistant Adjutant General, U. S. A.

INSTRUCTION for firing the pistol from the horse is well established. It is difficult, however, to analyze the method practiced by the best shots, or to describe it except in a general way.

In the first place, pistol shooting, owing to the unsteady support the hand gives the weapon, should always be according to the "snap" method; that is, the eye is not taken from the object to look along the pistol, nor should any effort be made to align the pistol between the eye and object. The best results are obtained when there is no perceptible pause between quickly projecting the pistol and firing; no attempt being made to look along the barrel to see if it points at the object. The pistol bullet must be directed instinctively, as is the arrow from the bow, or the stone from the sling. The cavalryman must do this first dismounted, for there is no other way of delivering the pistol "blow" when mounted.

The same is true of carbine firing mounted, when the horse is in motion at the gallop.

By the following method great skill is usually soon attained in pistol firing at an object in front, rear, or on either side; when moving or still; when both the firer and object are moving; when firing at an object only seen for a moment, the eye taking only its direction and speed; or when firing with two pistols at two objects in divergent directions and at different distances. It must be admitted by the cavalryman that he should be able to give all such pistol "blows," if possible, and the surprise generally is, if he does not succeed when the following directions and suggestions are carried out:

The first principle to observe in rifle or carbine firing, and especially in pistol firing, is to extend the thumb when holding the handle. It must be extended as nearly as possible in the direction of the bore of the

weapon and the prolongation of the fore-arm, and *not grasp* the handle. This extension brings the thumb along the side of the revolver pistol-hammer, and the inner end of the handle should rest over the little finger. This method of holding gives the necessary and all possible support to the weapon.

Experience has shown that the extension of the thumb along the stock in the prolongation of the fore arm enables the weapon, whether rifle or pistol, to be not only quickly aligned on the object, but, after a little practice, to be thrown into accurate alignment with it from any position without looking at weapon at all.

To make the best use of the pistol the cavalryman, when firing, must, if possible, place his thumb in the prolongation of the fore-arm; this not only to give quicker and truer direction to the projectile, but better control of the weapon when it recoils. The remarkable recoil of the pistol follows from its construction, the point of support in the hand being so much below the line of recoil in the barrel. The objectionable severity of this recoil is much overcome by extending the thumb over the grip as proposed.

The reason for the thumb extension is a physiological one, and found in the fact that thereby is best secured that opposition of the thumb and forefinger which gives the hand its wonderful power of manipulation. In the usual way of holding the pistol, owing to the form of its handle, the best use of the thumb is not and cannot be made; hence the use of one of the most important factors in the nice manipulation of a delicate instrument is hardly called into requisition at all. By the adoption of the thumb-piece on the lever arm of the pistol safety-stop this extension is, so far as practicable, secured.

The "blow" with the pistol should be delivered after the same manner as the "cut over the point" with the foil. To make this cut successfully, it is absolutely essential that the thumb be extended along the grip; it is equally essential, in making the pistol "blow," that the thumb be extended along the handle, in the prolongation of the fore-arm, and as nearly as possible, directly in rear of the barrel. One should no more attempt to sight the pistol than the foil in making a blow; but, looking at the object, give the weapon true direction by the hand — to do which the thumb must be extended on the grip. Although this has been well established, probably ever since pistols were made, certainly ever since they were used in the duel, it is not generally known, and it seems not to have been taken into consideration by revolver manufacturers. To admit it now and in consequence modify the cavalry revolver, will of course, be expensive to manufacturers and to the government; but that it is true and will be of inestimable advantage when done is the opinion and experience of pistol shots. A safety-stop device to the pistol, which

prevents the possibility of an *accident*, and one which requires the thumb to be extended nearly as proposed, has been tried and found to work well.

Snap firing, the only kind which mounted men can adopt with advantage, should begin on foot, at black pasters placed on a canvas target five paces distant.

In firing, the eye must see only the object, and the pistol must be projected at it and fired with the same motion and rapidity that a missile is thrown from the hand, from the same raised position of the arm. The bullet should leave the pistol just as the thrown missile does the hand, the object at which the projectile is thrown being alone noticed.

First, on foot, cock, project, and snap the unloaded revolver at some object not more than 5 paces off, and note, as the hammer falls, where it points. Do this each day, at first some 12 or 24 times, before a shot is fired, till the pistol is found when snapped to be *in line* with the object. Repeat at intervals.

Then place one round ball-cartridge, 10 grains of powder, in the revolver, to be discharged after the fifth snap.

Repeat frequently, always noting where the pistol points when snapped, so as to correct any error in its grasp or projection which prevents it from taking *a line position.*

Then insert two cartridges, two empty chambers intervening. Repeat frequently.

After a few days, three, four, five, and then six cartridges should be fired in succession, at the same time gradually increasing the distance.

In this way good snap *line shooting*, effective in war, will soon be made, and with a small expenditure of ammunition.

As the firer instinctively *feels* the way to throw the bullet (for he must not even glance at his pistol) and acquires skill, the distance from the object should be increased 2 or 3 paces.

At 10 or 12 paces he should, after glancing intently at the object, look away and then fire; with the back to the target, standing in the position of "guard," look over the right shoulder and fire; occasionally fire across the body, the left side being toward the target. This first practice up to 15 yards should be with reloaded shells, 10 and 12 grains of powder, and the round dropped ball, .44 caliber.

As soon as good firing is made at 15 yards, instruction after the same manner, at a 4-inch bull's-eye, with 16 to 20 grains of powder and the 230-grains bullet, should be continued up to fifty yards, increasing the distances of the firing points by 5 paces at a time. Beyond 50 yards the regulation cartridge and bull's-eye should be used up to 100 yards.

Mounted firing with the pistol, reduced charges, should begin as soon

as good dismounted firing is made at 15 yards, and be carried on along with dismounted firing, on alternate days or weeks.

The foregoing gives at least an insight into the best method of revolver firing. Its reasonableness will become apparent as soon as tried.

At first rather wild shooting must be expected; but if the practice is begun with reduced charges, the surprise will probably be at the rapid improvement and at the increased interest and the great and immediate skill attained in *mounted* firing; this, after all, is the object desired.

As soon as the possibilities of the pistol are fully recognized, and the cavalry generally accept this weapon for close fighting, the handle will be so fitted to the hand and the hammer so adjusted that it can be used to much better effect than at present.

The devices for bringing about efficient work with the carbine and pistol, mounted, mounted, and rendering the revolver safe to comrades in ranks and reloading it rapidly, are—

First.—The automatic check-rein, whereby the cavalryman can control his horse for brief periods without the use of his bridle-hand.

Second.—The safety-stop, whereby the cocked carbine and revolver can be handled freely in ranks, held in any position by the cavalryman without endangering comrades, whereby the extension of the thumb in firing becomes obligatory, and its opposition to the trigger finger is secured, thus enabling the firer to give true direction to the "blow" without sighting, and better govern the recoil of the pistol.

Third.—The cartridge-pack, whereby the pistol cartridges are assembled in clusters, in a very secure and inexpensive manner, so that they can all be inserted into the chambers of any of the jointed revolvers at one time.

Fourth.—The carbine detachable magazine, whereby five or ten cartridges are attached to it just in front of the guard and most convenient to the hand for reloading; this while the horse is at the charge and without the rider having to look at what the hand is doing.

Fifth.—The carbine-sling, whereby the carbine can be adjusted closely to the person, muzzle up, in the charge, in a simple and ready manner, and whereon the pistol-packs can be carried in a position for instant use.

THE CHECK-REIN ATTACHMENT.

The check-rein is especially useful for cavalry horses to enable cavalrymen to use both hands in mounted firing while the horses are in motion, and for hard-mouthed or restive horses in general. In their application to the special needs of the cavalry service there should be in every squadron spring attachments of at least three different strengths; out of every one hundred thirty should be limited to a pull of 10 pounds, sixty to 15 pounds, and ten to 20 pounds.

When used on cavalry horses, each trooper, knowing the amount of restraint his horse should have at a gallop, limits his stride to that gait by drawing back the rein upon starting, fixing the curb at the proper point by fastening it over or in any convenient way to the pommel of the saddle, thus effecting the control needed.

It is preferred the buckle which unites the ends of this check-rein should be fixed near the attachment of the left rein, in order to readily adjust it with the left hand.

It then only remains for the trooper with another rein to guide his horse, having both hands free to handle his carbine while firing and loading. By this means the perfect alignment of a cavalry force may be maintained in a charge, where perfect array is absolutely essential for success. The play of the spring affords the horse such movement of his head as not to hamper him in going over uneven ground, in jumping, or in case he stumbles and falls.

With such a check-rein all horses hard to control, or while mounting, when the pressure on the bit is apt to be relaxed, can be brought into subjection, so as to give great freedom to the hands.

The automatic check-rein is expected not only to secure good mounted firing in the charge, by controlling horses and keeping squadrons aligned, but also to be of great service in training cavalry horses to keep, at all gaits, an evenness of stride and length of step which will enable troops to maintain at all times their alignment, so that the service of most guides can be dispensed with, and also a large number of the commands prescribed in tactics which are difficult to hear on the drill-ground and impossible to understand in the noise and excitement of battle. With such a check-rein all horses hard to control in harness or in mounting under the saddle, when the pressure upon the bit is apt to be relaxed, can be brought into subjection so as to give great freedom to the hands and render the office of a groom unnecessary.

A horse unhitched, without rider or driver, with this check rein properly adjusted, will be under such control as to feel no disposition to run, and if he does will be under such restraint as to limit his speed and render it an easy matter to stop him.

The check-rein attachment is preferably fastened to the curb-rein next to the bit, while another curb-rein is held in the hand to guide the horse.

In case the pommel of the saddle is encumbered with the holster, or overcoat, or any part of the accouterments of the cavalryman, placing the check-rein over it may be a very unsuitable adjustment. In that case it can be fastened to the front of the saddle by a very simple device devised by myself.

SAFETY-STOP.

The safety-stop is an attachment for pistol, carbine, or rifle, by which the hammer may be retained at full-cock without danger of discharge when pulling on the trigger alone; and it consists of a pin or stop which is operated by the application of the thumb upon the grip in opposition to the trigger-finger. The danger of unintentional or premature discharge of a weapon is always considerable, and with mounted men using the pistol in hand-to-hand conflict there is always danger to comrades in the ranks by the premature discharge of this weapon, either on account of unmanageable horses, when both hands are needed to control them, or from the convulsive movement of a man who has himself been shot. In order to avoid this danger the movement of the hammer is arrested when at full-bent by a device which, in addition to the nose of the sear catching in the tumbler-notch, renders the combined operation of the forefinger and thumb necessary to discharge the weapon.

As the pistol is ordinarily held with the hand grasping the stock, the thumb will not be placed upon its support; only when the pistol is projected in the act of firing will it be extended and placed upon the lever-arm of the stop, and as it will be in opposition to the forefinger in this position, there will be in the act of firing a firmer grasp upon the weapon, which will steady it and prevent its being pulled off to one side and control its recoil.

In order to discharge the cocked pistol, the deliberate action of a pull on the trigger by the forefinger and a pressure by the thumb on the lever-arm of the stop is necessary; hence, the accidental discharge of the cocked pistol is almost an impossibility.

It is evident the stop can be applied to any gun and should be to the carbine, not only to secure safety to comrades in mounted firing in ranks, but to make the thumb extension imperative, for it is an absolutely necessary position for it in snap shooting.

THE PISTOL PACK.

The pistol-pack presents a means for rapidly reloading the chambers of revolvers; it consists of cartridges secured together so that they can all be instantly inserted and the holding device removed. This pack affords a means by which the chambers of any jointed self-ejecting pistol can be loaded simultaneously and in three seconds. The need of such a pack for certain and rapid reloading is absolutely necessary in war, and especially where the pistol is used in hand-to-hand combat, where success depends upon the rapidity with which it can be reloaded and discharged.

There are two forms of packs; both are constructed upon the same principle.

The pack is durable enough to stand any kind of handling and transportation, and if the parts are preserved they can be used many times.

THE CARBINE DETACHABLE MAGAZINE.

To make carbine firing as well as infantry skirmish firing most effective, it is absolutely necessary that there should be at least a detachable magazine on the carbine and rifle, for the position of the soldier in firing, either on horseback or lying down as a skirmisher, makes it necessary for him to have his cartridges nearer the receiver of his rifle than they are when carried in his belt. Hence a detachable magazine, having five or ten cartridges, is suggested, to be, by a simple locking device, attached to the gun in front of the guard and just under the receiver. Thus attached, the cartridges will not be in the way in manipulating the breech-block, and be in the most convenient place for the cavalryman to handle when mounted and firing at the gallop, or for the infantryman to use when in either the prone or supine position.

It is designed that these cartridges be put up in cases containing five or ten at the arsenals, and so transported and issued to and carried on the person of the soldier. When one case is emptied, it can be instantly removed and another taken from the belt and attached. In this way is provided a practical magazine, which for the time being forms part of the rifle, and which in action may be thrown away after being emptied, but, ordinarily, would be replaced on the belt to be subsequently refilled. The belt will, usually, carry nine magazines.

The advantages derived from this method of supplying cartridges to the military are:

That more can be carried on the person than by any other method.

That the carbine and rifle can be more readily and conveniently loaded from such magazine attached to the rifle, under the receiver, than by any other method, especially in skirmish firing.

This magazine is balanced on the rifle, and is so situated that it does not interfere with its poise and balance. Its center of gravity being in the vertical plane through the axis of the rifle, it will have no tendency to turn it in aiming and firing — a result which must be inevitable when the magazine is attached on the side of the rifle, a position for it which cannot fail to prevent good firing.

In this magazine the wood cannot swell so as to fasten in the cartridges, nor will they fall out by gravity or any ordinary jar when the uncovered magazine is turned with the cartridges heads downward; yet they can be extracted without the slightest pull.

Cartridges so put up will effect an enormous economy in the labor of the Ordnance Department and of the military, for from the time they are put into the magazines at an arsenal they do not need handling till put

into the rifle; hence they do away with the use of the present woven belt and the cartridge box. Each magazine is a cartridge box in itself, and for garrison purposes, at a trifling expense, one or two for each soldier can be made most attractive in appearance for dress occasions.

Now the Ordnance Department issues the cartridges twenty in a box; when they reach the soldier they are taken out singly and put singly in his belt, and thence singly carried to the receiver of the rifle. With the magazine they go to the soldier and his belt ten at a time, and from thence under the receiver of the rifle ten at a time. In aimed firing as skirmishers the soldier now, in order to fire seven shots in twenty-five seconds, is obliged to carry four in his mouth, two in his hand, and one in the receiver. With this magazine he can carry ten (practically) in his receiver. Hence it may be expected he will fire ten aimed shots with this magazine where he now fires seven.

It will be possible to issue these magazines on the field of battle, looped on copper wire or strong cord of such length that, if the soldier gets them at a time when he cannot dispose of them on his belt, or in excess of the number he can so dispose of, he can attach them to his person, around his waist or over his shoulder, till it is convenient to put them on his belt.

The locking device for attaching the magazines to the rifle and the belt is strong, effective, simple and economical.

There is now great need felt of some such detachable magazine for the carbine and rifle on the skirmish range; while in action it is all important to render skirmishers more self-reliant and formidable, and the firing line in battle more dangerous.

The merits of the one proposed depend upon the position it occupies on the rifle and carbine, the simple and inexpensive means of carrying them on the belt and attaching them to the rifle, and the means employed to retain the cartridges in their receptacles.

It is probably not necessary to use more than two screws to fasten the locking-plate to the magazine.

A cutting machine and crimping die which will at the same time punch the screw-holes, simple and inexpensive, can be constructed to make the magazine plates as rapidly as nails are made, and when manufactured by machinery and in large numbers will not be much more expensive. The more porous the wood the larger must the cartridge receptacles be to allow for the contraction thereof when exposed to dampness and rain. The magazine for war is preferably made of some light wood, the material and labor costing not more than 15 to 20 cents. But even at that price, throwing away the empty magazines would only be permissible in the heat of battle, when everything gives way to the exigencies of war.

THE CARBINE-SLING.

The carbine-sling is made to contain on the front part eight receptacles for pistol-packs, so that they will be nearest the hand when the pistol is to be reloaded; and the back of the sling contains a double or single spring-hook, into which the carbine, when reversed and the swivel fastened into a special screw-ring in the lower end of the guard-plate, may be forced muzzle up. In this position it will enable the cavalryman to mount his horse without difficulty and without danger, cannot interfere with the arm when the pistol is used, will not entangle the rider with his horse should he fall, and will be in position for use should he be thrown or separated from his horse.

The play of the carbine-swivel is limited to a movement of only five inches, by a stop strap fastened on the inside of the sling and about twenty-one inches from the buckle. The hook should be fastened at about fifteen inches from the center of movement of the swivel, and should probably be covered with rubber or leather, to prevent it from injuring the barrel.

When the carbine is slung on the back the swivel should be detached from the swivel-ring and fastened *in a special ring in the stock*, so placed as to secure its best adjustment.

By this arrangement it is not proposed to do away with the long carbine-boot for carrying this weapon when detached from the sling. It is only a substitute, at times, in lieu of dropping the carbine in the charge with pistols, or on the march, or when dismounted, and in place of hanging it over the shoulder in mounting, no easy task with an unmanageable horse.

The bend of the hook should be so great that the barrel, after entering, will have some play. This will prevent the carbine from jolting out.

In firing the carbine while mounted, it should be detached from the swivel.

While eight or nine receptacles for pistol cartridges may be placed in front of the sling, the number to be carried can only be determined by actual experience. Nine packages of cartridges weigh six pounds six ounces, which may be too much weight on the chest and interfere unduly with respiration. Possibly four packs, twenty-four cartridges, weighing forty-four ounces, may be all that in any emergency can be used. With only four packs on the sling it may be possible to successfully fire the carbine attached to the swivel.

The hook on the rear of the carbine-sling is in connection with the swivel-ring at the end of *the guard-plate*, and is adapted to sling the carbine on the back, muzzle up, to conveniently dispose of it in mounting, at times on the march and at drill, and in the charge with the pistol. Both

hands will usually be required to sling the carbine on the back. The entrance to the belly of the hook is slightly smaller than the diameter of the carbine barrel.

METHOD OF LOCKING THE CARBINE TO THE SLING, MUZZLE UP.

Pass the swivel-hook into the ring prepared for it.

Drop the carbine and reverse it till the muzzle is between the shoulder-blades, using the swivel attachment as a fulcrum, and hold it in that position; at the same time pass the left hand, palm outward, between the back and the sling near the hook, and grasping the sling and the barrel force it into the hook.

The carbine is disengaged by the reverse operation.

While no special importance is attached to the method of slinging the carbine, it will, nevertheless, be found a most comfortable and convenient way of disposing of it at times, and when so slung will secure better pistol practice than when it is suspended by the swivel.

WAIST-BELT FOR CARBINE-CARTRIDGES.

This belt contains locking plates, to which any required number of magazines, containing five or ten cartridges, may be instantly attached, in the same secure manner as they are to the carbine, and can be instantly detached for use on the carbine.

The following order of instruction with the automatic check-rein and the reloading device for the pistol and the carbine-cartridge magazine in single rank, close order is suggested:

First.—Several drills, without arms, with the check-rein attachment, at all paces.

Second.—Advance at the walk, halting at 20 yards, and aim and fire the carbine with blank cartridges.

Third.—Advance at the gallop, halting at each 100 yards, and aim and fire the carbine with blank cartridges.

Fourth.—Advance at the walk and gallop, with the carbine slung muzzle up or carried in the boot, firing the pistol with blank cartridges without halting.

Fifth.—Advance at the walk and gallop, firing the carbine, with ball-cartridges, at targets, commencing at 300 yards, halting to aim and fire, and continue the advance till within 100 yards of the target, noting the number of hits.

Sixth.—Advance at the gallop, with the carbine slung or in the boot, firing the pistol with blank cartridges, noting the number that can be fired by troops in a charge of 100 yards; also the number in a charge of 600 yards.

No aim — no deliberate aim — can be taken when firing snap-wise at the gallop. The projection of the carbine in the true direction of the object and firing are practically simultaneous motions. Hence no command of aim can properly be given. In firing by volley, at the gallop, the only commands are: "Fire by battalion (or company)." "Ready, fire."

Finally.—Advance at the gallop, firing the carbine snap-wise at targets, commencing at 600 yards therefrom, without halting, the carbine detached from the swivel, using ball-cartridges; dropping or slinging carbine at 200 yards distant, and firing the pistol up to 10 yards of the target, noting the number of hits.

MARCHING CAVALRY.

By BRIGADIER GENERAL W. MERRITT,

Brevet Major General U. S. A.

EXPERIENCE in marching cavalry commands in this country, establishes the fact that the distances laid down by Europeans as a forced march for that arm (twenty-five miles a day), is no more than well-marched cavalry can accomplish for six days in every week in a campaign. This distance should be marched in from five to six hours, including halts.

A longer time than six hours spent on the road in marching twenty-five miles, is a positive detriment to a cavalry command. Any shortening of the time to less than five hours, depending on increased rate of marching, would probably result in injury to the horses.

It is proposed to state in detail how this march for cavalry should be made.

Cavalry in ordinary marches can and should start on the march, for nine of the longer day months of the year, by half past six or seven o'clock, and for the winter months, about an hour later. This leaves ample time, after a seasonable reveille, for care of the animals, breakfast for the men and packing of the wagons or pack mules.

Every duty of the camp on the march should be performed by trumpet calls, sounded under the direction of the commanding officer. First, "Reveille," then "Stables," "The General," "Boots and Saddles," "Mount" and "Forward." The hour for the first of these, followed at once by the second, is designated in advance and remains fixed.

Breakfast is taken by the men immediately after "Stables."

The "General" and the calls that follow, should be ordered by the Commanding Officer, and sounded by the Orderly Trumpeter, who reports after his breakfast for the purpose.

This is more important than it may at first thought seem. The Commanding Officer must regulate these calls by the state of preparation, which some mornings, depending on the weather and other matters, will advance more rapidly than on others. No one call should ever be sound-

ed until the duties pertaining to the call which has gone before, are completed. If the "General" is sounded before breakfast is over, or "Boots and Saddles" before the camp equipage is packed, confusion, ill-temper and a badly conducted preparation ensue, which will effect the command, worse perhaps than one would imagine, for the whole day. A half hour's delay in leaving camp is better than an ill-conducted rush, which will get the command out of camp at the preconceived hour, but leaves horses and men fretted and uncomfortably packed for the march. Too much attention cannot be given to the tone of a cavalry command for a march. It is not too much to say that of two commands which march with similar outfits, that the horses of that command will best endure the fatigues of the march (all other things being equal) which is in best tone and temper during the march.

In the preparation and start, as well as in the smallest details of the march, the closest supervision of the Commanding Officer must be exercised. As no call should be sounded until the duties of the one which precedes it are practically completed, no one should be allowed to anticipate the duties pertaining to a call. No horse should be saddled, with the exception perhaps of that of the Orderly Trumpeter, until the signal sounds, when all are saddled. It may be necessary for men in the troop to saddle, at the call, horses of men who are at headquarters packing the baggage and mess kits. This should be attended to in the troop, and the details carefully regulated by the troop officers. As soon as the "General" sounds, one or more troop officers should repair to the troop grounds and superintend the details of everything till the march begins. "Boots and Saddles" is the last call sounded at general headquarters until the march commences. Here it may be remarked that "Boots and Saddles," without any preliminary call, is an alarm. It covers the saddling of the horses, forming ranks and mounting, without any other commands from headquarters. On the march, unless orders are in force to the contrary, it covers the same amount of preparation, and is followed by the "Forward" from headquarters, orders having already been given as to the order of the troops in column. It may be remarked that in large commands the preparation, except in the leading battalion, would stop at leading into ranks and standing to horse, as care must always be taken in cavalry that no officer or trooper should remain mounted unnecessarily.

The column in route should habitually be a column of fours. With large commands the double column of fours can be used to advantage. Less than the column of fours should never be permitted on the march of a command greater than a troop, and as a matter of practice, it is believed that even so small a force as a troop should habitually march in this column. In commands not larger than a battalion, an increased distance on the road between troops, depending upon the avoidance of dust, may

be permitted, though the distance should never be so great as to interfere with the compact march, as a unit, of the command.

The active interest in every incident of the march must begin with all the officers of a column the moment the "Forward" is sounded. That officer who throws himself into the saddle and listlessly settles into his haunches for the—to him—dull routine of a march, is bad as an example and useless in control. Better for the command that he should make the march rolled in a blanket in an ambulance. The men should be required to sit up on their horses, and not loll in the saddle. The column of fours should be kept closed, and on difficult roads made to spread out, taking diverging trails about bad places, through brush or over crossings, and to pass ahead of, rather than to rein up and wait to follow in single file, the troopers who have pursued the direct practicable trails. All this requires close attention and activity on the part of the troop officers.

At the end of the first hour the column is halted for from ten to fifteen minutes. This should be habitual, and the men and horses of a command should be trained to expect it. During this halt the saddles should be adjusted and the men should be encouraged and required, if need be, to "Go to the rear," which should not be allowed at other times on the march, unless a trooper is sick, in which case it would generally be better to send him to march with the train, under the care of the surgeon.

If the command starts from camp at 7 o'clock it will be 8:15 before it marches after the first halt, and it will have left to march about twenty-one miles out of the twenty-five for the day. Each hour after the first, the halts should be not longer than five minutes, or better, at the second halt, stop for a minute or two, then move forward on foot, sounding the "Forward," and stepping out briskly. After leading for fifteen or twenty minutes, halt for a minute or two, then mount and move forward at the trot for fifteen minutes, after which resume the walk till the completion of the hour. These exercises repeated each hour of the march, will give a needed variety, lighten the work on both horses and men, prevent saddle sores and chafing, and complete the march, as a short calculation will show, inside the time above specified. The trot can be taken up to advantage for ten or more minutes, twice or oftener during each of the last three hours of the march, so that the hours' march will cover about six miles of the route; nor will the gallop for from seven to ten minutes be found to be an injury, in a well-conducted command.

It is not possible to complete an article on this subject without repeating rules, which, in order to be enforced, must be constantly repeated.

Permit no man to leave the ranks mounted.

Permit no horse to be watered, officer's or private's, save when all are watered.

There is no stream where in watering there is not room generally for

a battalion of cavalry to water, if the officers superintend and require it to be done properly. In larger streams which are fordable, the leading troops should be marched nearly to the further bank and formed "Right and left front into line" before being permitted to drink, thus leaving room for the troops in rear to make a like formation in the middle of the stream and also near the hither bank, so that in a stream eighteen or twenty feet wide, you may have a double column in mass, consisting of from six to eight troops of cavalry, all the horses drinking at once.

In watering at smaller streams the troops should be marched out from the column on each flank for several hundred yards if need be, the precaution being taken to send officers or non-commissioned officers in advance at a gallop to select convenient places for watering, and to direct their troops to these places by signal.

It does not require an elaborate calculation to show how much time is thus saved with a little care, nor need anyone be told how trying it is to the command for the leading officers and troopers of a column to halt on the brink of a stream to quench their thirst, stopping the way for a column of hundreds of dry and dusty-throated horses in the rear, when a little care would permit all to drink at the same time.

My advice to an officer commanding a march is to arrest an officer or confine a trooper who wilfully neglects attention to the smallest details of the march, so necessary to the preservation of the endurance of the men and horses.

The foregoing has been written with the understanding that forage for the horses is carried with the command or obtained at the camps. If the command is to subsist by grazing, the length of the march, as well as its details, must be modified. Not unfrequently in marches on campaign a cavalry command makes an unforseen halt for half an hour or more. In these cases a careful commander will select the halting place as far as may be where the pasturage is best and form in column on the grass, requiring the horses to be unbitted so that they may graze with facility. During war an enforced halt of this character near a grain field or stored forage can be used to give the animals a much-needed feed. A command, large or small, should never remain mounted for even a short halt. A last caution to a cavalry commander accompanied by a train is, never to permit a wagon to leave camp or to occupy the road until the command has marched.

FORCED MARCHES.

Cavalry in exigencies can march for from three to five days at the rate of 50 miles in 24 hours. A single march of not to exceed 100 miles can be accomplished in 24 to 30 hours. The manner of marching in making forced marches must depend on the total distance to be made. If the

distance is not more than 100 miles, the usual halts at the end of each of the first four or five hours must be made as in ordinary marching, and during the entire march which should be made in 30 hours or less, there should be not less than two grand halts to feed and refresh both horses and men. In these, which should last for two hours each, the horses should be unsaddled and permitted to roll and feed or lie down as they prefer. These halts should be made on the completion of the first and second thirds of the march, depending on the advantages of water and otherwise fit stopping places.

If the distance to be accomplished is more than 150 miles, the forced march should commence at the rate of not to exceed fifty miles for each day, and beyond 200 miles, the marches should be reduced to forty and even thirty miles per day.

These marches, it is hardly necessary to say, refer to commands of horses and men which are in the best possible condition for marching. This condition in garrison is obtained by subjecting a command to the usual garrison duties and daily mounted drills, in the absence of which there should be at least two hours exercise on the road for the horses of a command. Easy campaign marches of from ten to fourteen miles per day, are good in preparing both horses and men for forced marches. Without this preparation, a command will not be able to make the marches, either campaign or forced, and an attempt to accomplish even a portion of the distances mentioned must result in the destruction of a cavalry command through disabling or killing the horses.

The following, as illustrations of forced marches, are extracted from different sources as being of interest on the subject; it should be remarked that the instances are not intended as even an approximation to a complete list of the many long distance marches, now of record, especially in our own service; almost every Indian campaign of the cavalry during the last half century had one or more forced marches for long distances which illustrate the endurance and pluck of the American horseman and the capacity of the cavalry for its legitimate work:

"Letters regarding cavalry," by Prince KRAFT DE HOHENLOHE-INGELFINGEN:

"During the battle of Columbey-Nouilly, 14th August, 1870, a squadron of dragoons of the guard, pursued a body of French Chasseurs as far as Toul, and summoned the town to surrender. On the 15th, the guard corps received orders to give up the brigades of dragoons to the 10th Corps, temporarily, and on the 16th, these horsemen took a decisive part in the battle of Mars-la-Tour." The writer says: "We can hardly expect a more rapid march from a body of cavalry, for the distance from Toul to Mars-la-Tour is 32 miles in an air line."

"On the 27th, some of the boldest cavalry officers rode around the

French army, and their reports established the fact that its corps were in the neighborhood of Vouziers. One of these officers must have made on that day nearly 85 miles."

"After the engagements of Artenay and Orleans and the capture of that place on October 11th, the 2d and 4th cavalry divisions pursued the enemy 34 miles to the Sauldre and towards Blois and Marchenoir, where they were met and stopped by fresh infantry."

"We require cavalry to traverse 28 miles per day, for two or three consecutive days. There have been cases where detachments have had to march greater distances in a day. (For instance, the 150 Ulans of Thuringia made 52 or 53 miles on July 15, 1866.)"

"We see our officer's patrols making as much as 84 miles in a single day. In the advance on Chalons, in 1870, the advanced Prussian cavalry divisions made 85 miles in two days."

The following is given as the method of a forced march of 31 miles in the German army for a division of cavalry:

About 2. miles at a walk, half an hour.
About 2.33 miles at a trot, quarter of an hour.
About 2. miles at a walk, half an hour.
About 4 5 miles at a trot, half an hour.
About 2. miles at a walk, half an hour.
About 2.33 miles at a trot, quarter of an hour.
About 2. miles at a walk, half an hour.

17. miles in three and a half hours, with half an hour's time for short halts.

Grand halt of two or three hours

About 2. miles at a walk, half an hour.
About 2.33 miles at a trot, quarter of an hour.
About 2. miles at a walk, half an hour.
About 2.33 miles at a trot, quarter of an hour.
About 2. miles at a walk, half an hour.
About 2.33 miles at a trot, quarter of an hour.
About 2. miles at a walk, half an hour.

15. miles in three and a quarter hours, with 30 minutes for short halts, thus making 31 or 32 miles in ten (10) hours.

During this march the cavalry divisions should be passed from formation of march, to that of combat, once each day.

Here are instances of "forced marches" in the Russian service:

"In 1884 two Sotnias of Don Cossacks made 218 miles in three days under the worst conditions as regards roads and weather. On the arrival of the detachment they were inspected by Gen. GOURKO at the walk, trot and charge. The Commander-in-Chief showed himself fully satisfied with

the appearance of the troopers and the state of their horses. The platoons were reduced, however, by six or seven files. Each Sotnia had left sixteen or twenty horses en route, which, for the most part, rejoined during the day and proceeded at once to ford the Vistula. See 'Un raid sur la Vistula, Revue Militaire de l'Etranger.'"

During the Russian Concentration in Bessaratia a brigade of cavalry marched in two days from Kicheneff to Odessa, 110 miles. See "Les Tendences Actuelles de la Cavallerie Russe."

Three Sotnias of Oural Cossacks, marching over roads covered with snow, made 46, 50 and 56 miles each in a single day. See Invalide Russe No. 231, 1883.

In the Russian autumn manœuvers of 1883, detachments of cavalry made 200 and 300 miles in five days.

In our own service there are many instances of long-distance marches, familiar to officers of cavalry experience. Some of the members of this Association having been participants in these marches. These it is not necessary to enter into in detail.

The cavalry of our service owes much to that prince of cavalry officers, General P. ST. GEO. COOKE. Besides being a most accomplished tactician he was especially successful in making long marches rapidly and with most perfect preservation of his horses.

The writer of this had the good fortune to accompany Gen. COOKE as a staff officer in the march of the command in from Utah in the summer of 1861. The command, which consisted of infantry, cavalry and artillery, marched from Cedar Valley, beyond Salt Lake City, to Fort Leavenworth by forced marches, and while the details of the march are not obtainable, it is recalled that the horses of the cavalry and artillery, though little forage was fed, were in better working order on the completion of the march than they were on its inception.

The same accomplished cavalry officer, General COOKE, made many marches distinguished for their success as long distance marches. One recorded in the history of the 2d Dragoons, with a squadron 100 strong, from Lawrence, Kansas, to Fort Riley—a distance of ninety-eight miles—was accomplished in less than twenty-eight hours.*

Our Civil War furnishes many instances of successful distance marches, both by the Confederate and Union cavalry. In fact, a forced march on the part of the cavalry of one army presupposed a like march on the part of the cavalry of the other.

STUART'S Chambersburg raid with artillery and cavalry, 1,800 strong, was made at the rate of eighty miles in twenty-seven hours.

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* "I marched with a regiment on large horses, without a single feed of grain, twenty-two miles a day for ninety-nine days."—*Gen. P. St. George Cooke, U. S. A., page 394, Journal Military Service Institution of the U. S., No. XVI.*

One of the most successful forced marches of modern times was that made to the relief of the THORNBURG command by a battalion of the 5th Cavalry in the autumn of 1879. Several officers, members of this Association, were participants in that march. The distance accomplished was 170 measured miles. The time from 11 A. M. October 2d, to 5:30 A. M. October 5th. This was at the rate of sixty miles per day for two and three-quarter days. This march is mentioned as being peculiarly successful for, in brief, the following reasons:

First.—The distance accomplished in the time.

Second. –No horses were lost or disabled on the march, and there were noticeably no sore-back horses after its completion.

Third.—The command—men and horses—were in good condition for service at once after the march.

In reviewing the foregoing one is impressed with the simplicity of the problem to be solved in order to march successfully, cavalry or mixed commands for long distances, or for continued marches of the ordinary campaign. Everything is comprehended in the words, *constant care of horses and men.* Too often our horses are sacrificed by the neglect of this. I quote in conclusion from a letter recently received from General COOKE, who says: "Any unusual success I may have had in cavalry marches, I suspect may be attributed to my constant thoughtfulness and attention—my great interest felt in the welfare and comfort of *horses and men*—I fear in that order."

MOUNTED FIRE ACTION OF CAVALRY.

By MAJOR G. B. SANFORD,

1st Cavalry, Brevet Lieutenant-Colonel U. S. Army.

I DESIRE to invite the attention of the Association for a few moments this evening to some remarks upon the use of the carbine and pistol on horseback; to discuss the question whether such use is advisable at all, and if so, to what extent and how far it should take the place of the saber and lance.

The U. S. Cavalry is at present armed with the saber, carbine and pistol—the two latter breech-loading fire arms, the ammunition contained in metallic cartridge cases.

It is to be taken for granted that we are to use all these arms in some way or other, and it would seem that definite rules for their use should be laid down by the proper authority.

The fact that widely different opinions as to the proper use of each arm, and in some cases as to whether the arms are useful at all prevail, makes the subject a difficult one. The rapid improvement in fire arms since the introduction of rifled weapons, which is still going on, seemed at one time likely to lessen greatly the value of the cavalry arm. The wars of the last quarter of a century have dissipated that theory, but have led to a great deal of discussion as to its proper use. As regards the great value of its work as a screening and reconnoitering force there is no question. As to its value as a dragoon force, opinion in this country has been favorable, but has not yet obtained very general acceptance in Europe. As to whether it can hereafter appear in heavy masses and by charging in line or column affect the fate of battles, is still a matter of doubt, to be determined only by future wars.

Modern cavalry may be loosely divided into heavy and light cavalry; the former armed with pistol and saber and, in some cases, with the lance, the latter, with pistol, saber and a carbine. In most of the continental armies the carbine has been added to the equipment of the heavy cavalry, so that the two bodies are practically armed alike; the principal difference being in the weight of the men and horses. This is notably the case in

the army of Russia, where within a few years, all the lancer regiments, except a few in the Imperial Guard, have been converted into dragoons.

The universal acknowledgment that a fire weapon is necessary to the cavalry being recognized, the question arises as to whether its use shall be confined to the carbine on foot, or the carbine or pistol, or both, shall also be used mounted. Looking back at the action of cavalry from the introduction of fire arms to the present time, we find that their use on horseback, though often resorted to, has been in the end generally condemned, and that during those periods in which mounted fire has been most taught and practiced, the cavalry has accomplished least and been at its lowest point in public estimation. On the other hand, under the influence of such reformers as GUSTAVUS ADOLPHUS, FREDERICK THE GREAT, SEIDLITZ, MURAT and others, who steadily forbade such use, it attained to great celebrity. Early in the sixteenth century the petronel, the first fire weapon used by cavalry, was abandoned and the arquebus or wheel lock substituted. The petronel was in reality a small hand cannon, fired by a match; the stock rested against the cuirass and the muzzle was supported by a crotch which stood up from the pommel of the saddle. The wheel lock was a considerable advance on the petronel, but was very soon replaced by the pistol, which is generally used by the cavalry, and is known to have been used by the German Reiters, at that time the foremost cavalry in Europe, as early as the battle of St. Quentin in 1557. The system of the Reiters seems to have consisted in forming in squadrons of from ten to sixteen ranks in depth, and riding up within range of the enemy at a walk or trot. The first rank then fired two shots each, whirled outward from the centre and formed again in rear of the last rank, where they reloaded their pistols. The second rank took up the fire as soon as unmasked by the first, and so on throughout the column. This gave considerable weight to their fire, but it was soon overcome by the French cavalry, which adopted the custom of charging in upon them at speed with the saber, and generally succeeded in routing them.

Later in the century a custom arose of drawing up the cavalry in two lines, with a considerable interval between them — the first line armed with pistols delivered their fire, wheeled about and retired around the flanks of the second line, which then charged home with the lance or saber.

About the middle of the sixteenth century the carbine came into quite general use, and very much the same tactics were employed, but in all, or nearly all the instances of which we have any record, the carbiners seem to have been easily defeated by the regular cavalry. MOTLEY in his "Rise of the Dutch Republic," gives a notable instance of this kind at the battle of Mookerheyde in 1574, where the carbineers of Count

Louis of Nassau, after defeating the Spanish carbineers, were charged by the cuirassiers and lancers, while wheeling to reload, and utterly destroyed.

So in 1590, at the battle of Ivry, the German Reiters, after delivering their fire were retiring to reload, the French cavalry seized the moment to charge, drove them back in confusion on their second line of heavy cavalry, commanded by the Duke of Mayenne, which was thrown into such disorder that they were unable to charge with any effect, and the battle was won by Henry of Navarre.

In the seventeenth century, Gustavus Adolphus, the great king of Sweden, appeared upon the scene and introduced many beneficial reforms. The cavalry tactics, as he found them, were of the very clumsiest description; the squadrons of great depth, the men heavily armed and equipped, scarcely able to move out of a walk, and relying almost entirely upon their fire arms. The Swedish king reduced the depth of the squadrons, at first to four and afterwards to three ranks. He directed that the front rank, after firing one volley from their pistols, should draw sabers and charge, instead of retiring to reload. After charging, they rallied to the rear, and the second, third and fourth lines followed in the same manner. This fire action seems, however, to have been only a compromise on the king's part with the previous disposition to use fire-arms only. He constantly inculcated the use of the saber in hand to hand conflict, and taught his troopers that it was to a proper use of that weapon that they were to look for success.

In 1643 the great Conde still further revived the credit of the cavalry service, and especially by his conduct at the battle of Rocroy, which was gained almost entirely by the action of the cavalry led by Conde in person, in a series of terrific charges.

Two years later, Conde came near suffering a very serious defeat at the battle of Nordlingen, owing to the directly opposite action of Marshal Grammont, who at that time commanded his cavalry, and who received the charge of the enemy's cavalry with a carbine fire at a halt. De Grammont was routed and pursued in utter disorder, and only by the most vigorous exertions of Conde was success obtained.

In the early part of the 18th century, Marlborough's cavalry, under Lord Cutts, during the battle of Blenheim, were attacked by the French carbineers, firing mounted. Cutts charged them with the saber, the forces being about equal and easily defeated them. Later in the same battle Marshal Tallard directed a force of over ten thousand French cavalry to make an effort to retrieve the fortune of the day, but as they again attempted to resist Marlborough's cavalry by a mounted carbine fire at a halt, they were ridden down and a large proportion, including Tallard himself, were forced to surrender.

CHARLES THE TWELFTH and Marshal SAXE continued the efforts now being made to make the cavalry a more mobile and active force, but it was reserved for FREDERICK THE GREAT to bring the cavalry arm to perhaps the highest state of efficiency it had ever reached. His first great change according to DENISON was to prohibit absolutely the use of fire arms mounted, and to compel his troopers to rely entirely upon the use of the saber in the charge at full speed.

The world was soon ringing with the fame of his horsemen, and out of twenty-two great battles fought by FREDERICK — NOLAN declares, that fifteen were certainly won by his cavalry.

It was not "fire action mounted" that gave the cavalry this masterful position, for FREDERICK had positively prohibited it and Major General WAR, one of his best officers, after SEYDLITZ and ZIETHEN, says distinctly: "Experience has convinced me on more than a hundred occasions, for I have never seen a squadron depend upon its fire, that it has not been overthrown by that which came upon it, at speed, without firing."

In the latter wars of the 18th century, we find no advance upon the ideas of FREDERICK. In the American Revolution the cavalry force of either side was small in number and its duties chiefly of a partisan nature. In the battles of that conflict, it exercised little influence on the result.

The same may be said of the early battles of the French Revolution, and it was not until NAPOLEON was firmly seated on the throne, that the cavalry, again conforming to the maxims of FREDERICK, SEYDLITZ and ZIETHEN, took its proper place.

"NAPOLEON," DENISON says, "had a very high opinion of the cavalry service, and understood thoroughly all the various phases of its duty. No man knew better the importance of light cavalry for covering the movements of an army, and for searching out, and watching the marches and designs of the enemy. He soon changed the system of organization in the French army and gathering together the scattered regiments of horse, formed them into brigades, divisions, and finally, into corps d'armee. The troops were taught to depend on the saber and lance, and even the dragoons and carbineers were principally employed as light cavalry though they occasionally dismounted to fight on foot. We have no record of their ever using the carbine on horseback, and towards the close of his reign many of the dragoon regiments were converted into lancers — the lancer at this time increased in popularity and attained great importance as a charging weapon. From the peace of 1815 no new principle was introduced involving the action of mounted troops, until the introduction of breech-loading arms."

During the great Civil War in the U. S., the cavalry were generally armed with the breech-loading carbine, Colt's or Remington's revolver and the saber.

These fire arms, however, were by no means equal to the arms now in use, being supplied with paper or muslin covered cartridges, and fired by means of a percussion cap.

The infantry, with the exception of a few regiments armed with the Sharp breech-loader or the Spencer magazine gun, fought out the war with the old muzzle loading rifled musket. In the charge the saber was generally used, and more especially by the cavalry of the Army of the Potomac. In outpost skirmishes and affairs of small parties, the pistol was often used in the charge. The Confederate cavalry were more especially given to the use of this weapon. Both sides used the carbine on foot to a great extent, being compelled to in the first instance by the nature of the country, which was generally rough, covered with high stake and rider fences, or stone walls, and often densely wooded. Another reason for the great use that was made of the carbine, is doubtless the fact that the volunteer cavalry, in the early days of the war had not yet acquired sufficient confidence in themselves as cavalry to attempt mounted fighting. This is illustrated by the fact that pretty nearly all the saber charges during the first year's fighting were made by the regular regiments, which, of course, cherished a traditional fondness for that weapon. As, instances, I can mention the affair at Fairfax Court House, under Lieut. TOMPKINS, of the 2d, or as it is now known, 5th Cavalry; the charge of the 1st Cavalry, under Col. GRIER, at Williamsburg, and of the 2d Cavalry, under Captain, now General MERRITT, at Beverly Ford. Later in the war this distinction in a great measure ceased to exist, and there were no more gallant charges than were made by the volunteer regiments and brigades. I allude to it simply to draw attention to the circumstance that as our cavalry improved in drill and gained in experience, their course was not in the direction of mounted fire action, but of the use of the saber. Where it was necessary from the nature of the ground or for other reasons to fight on foot, they fought on foot and used their carbines to good purpose, but when the conditions permitted mounted fighting, the carbine as a rule remained in its socket, and the men drew saber. It is only necessary to point to the action of the 1st and 3d Cavalry Divisions at Winchester, Cedar Creek, Woodstock and the Five Forks campaign to prove the truth of this assertion.

In the great valley of Virginia during the campaign of 1863 and in several battles of the campaign in the Shenandoah in 1864, there were many occasions where our cavalry had a clear field, but in none that I can remember did they use the carbine mounted, though the pistol was used occasionally and the saber often. In individual instances, outpost skirmishes, encounters of small advanced parties, &c., the carbine was occasionally used. Also in advancing with the heads of columns covered by a

force of mounted skirmishers, the carbine was often employed to hasten the retirement of the enemy's skirmishers, or to cover our own retiring forces when the conditions were reversed. I remember some very effective work of this kind by the 1st and 3d Cavalry Divisions, in the valley near Kearneysville, in August, 1864. The cavalry corps in moving out on a reconnoissance, had run up against, not only the Confederate cavalry which was to be expected, but a very large force of Confederate infantry, advancing towards the Potomac under General EARLY in person. It was of course necessary to fall back, and long lines of mounted skirmishers covered the retiring columns and by their fire succeeded in keeping the Confederate infantry at a fairly respectable distance, and enabled us to save our trains and artillery, though one brigade under CUSTER was cut off from the rest, and forced across the Potomac at Shepherdstown. In this case the mounted fire was certainly valuable, and perhaps the only thing that would have succeeded. The enemy's forces included RHODES', RAMSEUR'S, GORDON'S and WHARTON'S divisions of infantry, with cavalry and artillery, and was so immensely superior in number, that an attempt to detain them, by dismounting to fight on foot, would certainly have resulted in the capture of the dismounted force, which would have been surrounded by the overlapping flanks of the infantry. The country was not suitable for a charge in line, and even had it been, the loss in the charging force would have been extravagant as compared with any advantages likely to be obtained. As it was, the enemy was kept at a reasonable distance during the movement, the morale of the force was not injured in the slightest degree, and the object of the reconnoissance was fully attained. Of course if an enterprising cavalry command, sufficiently strong in numbers to make an impression, had been present, the disposition would not have answered, but as it happened, the main force of the Confederate cavalry, under General FITZHUGH LEE, was otherwise employed, and what there was in the neighborhood, did not think it advisable to press us.

In similar cases advancing or retiring, a cavalry force might occasionally accomplish its object with more facility, than in any other way. With such possible object in view, there is, in my mind, no question as to the propriety of drilling the men in the use of their fire arms mounted, but it should be fully understood that such use was to be exceptional, and that their main dependence would be the saber when mounted.

FREDERICK THE GREAT, although so bitterly opposed to firing in line mounted, that he ordered that any officer authorizing it should be immediately cashiered, still directed that his troopers should be thoroughly instructed in the use of their fire arms on horseback. His idea seems to have been that any firing in line, tended to weaken the soldiers' faith in the superiority of the charging weapon, and that therefore it was to be

discouraged. His reliance was placed undoubtedly on the lance or saber in connection with the shock, and the shock was not obtainable with the tendency to halt to aim, which the act of firing a carbine mounted, induced.

An instance of the determined use of the different weapons employed, once came under my observation towards the close of the war of the Rebellion. A squadron of the 17th Pennsylvania Cavalry, was ordered from Winchester to Martinsburg, Va. When about half way and while marching in column of fours, having just passed the village of Bunker Hill, the squadron was attacked by an apparently equal force of MOSBY'S cavalry. The latter were drawn up in line along the edge of a heavy woods, about two hundred yards from the road, and poured in a heavy volley from their carbines as the Union cavalry came up abreast. Immediately after, they drew pistols and charged as foragers, firing rapidly as they approached. The officer in command of the Union cavalry took the trot and gained a piece of open ground, on which his advanced party had halted, wheeled into line, drew saber and charged. The defeat of the Confederate cavalry followed almost immediately. Their men had scattered in the charge, and having emptied their pistols, pretty generally, were helpless against the determined charge of the Federal cavalry with their sabers. They retreated in disorder and disappeared in the woods, the whole affair probably not occupying ten minutes, and our loss being confined to a few flesh wounds, and one horse killed. This affair occurred about midnight, but as a full moon was shining and about two inches of snow on the ground it was practically as light as day. Had the Confederates charged with the saber, I doubt whether the Union officer would have had time to form line at all, but MOSBY'S men were not given to that sort of fighting, though like the rest of the Confederate cavalry, they would fight desperately enough in their own way.

The general results of the four years of war in America were immediately favorable to the cavalry force. Its place in public estimation, always high after the organization of the corps in 1863, was never higher than when, largely by its action under its gallant leaders, the war was brought to a close in the spring of 1865. The new principles developed, however, were not in the line of mounted firing, but in the great use which could be made of a cavalry force under *any* and *all* circumstances; in other words, to the fact that they could be made a self-protecting, independent, active force, and that the day had gone by when they could be considered like the artillery, an auxiliary force simply, enormously destructive it is true when properly handled and guarded, but utterly powerless to protect itself when alone. The principal conflicts of the last twenty years, the Franco-Prussian and Russo-Turkish wars have scarcely added to our information in this respect, though they have caused attention to be directed

more than ever before, to the manner in which cavalry was handled in our war. The French cavalry, as a rule, were held close to or in rear of the infantry divisions, and though the Prussian Uhlans, which at first astonished the world by the reckless daring of their advanced parties and reconnoitering forces, were eventually driven to the shelter of their infantry also, it was not by the action of the regular troops of the enemy so much as from inability to close with the franc tireurs, who attacked them from behind woods, stone walls, or any available ambush, and disappeared as soon as any strong party could be concentrated against them.

The German cavalry, who depended almost entirely on their lances or sabers, and rarely used the carbine, even for dismounted fighting, were unable to cope with this irregular force in guerrilla warfare, and their usefulness was, consequently, materially impaired. This fact has not escaped the attention of progressive officers in foreign services, and has led to much discussion, their attention being particularly drawn to the manner in which cavalry was handled on this continent, under similar circumstances, but with much greater success. As this involves, however, the use of cavalry dismounted, it does not come within the range of my subject, but will be treated of by others.

That the pistol is a very much more powerful weapon than before the invention of the metallic cartridge and other later improvements, cannot be disputed. The facility with which it can be reloaded disposes of the objection which existed when the trooper had to fall back to reload. The inventions of General KELTON, probably well known to most of the officers present, still further increases the efficiency of this arm. Whether they will result in making it the principal charging weapon of the cavalry, as General KELTON hopes and believes, must be left to be determined by more thorough experiments than have yet been practicable, and perhaps to the actual experience gained in future wars.

Experiments made at this post with the S. S. and Wesson pistol by Captain CARR of the 1st Cavalry, led to the belief that by the automatic check rein, and the cartridge packs of General KELTON, great rapidity of fire, combined with considerable accuracy, could be obtained at a rapid gait. The facility with which the weapon can be reloaded while in motion, by the use of these cartridge packs, gives it an advantage as a charging weapon which it has hitherto lacked.

Experiments with the carbine, mounted, by the same officer, showed that it was impossible to obtain any accuracy with it while in motion. Good target results were obtained, however, by galloping to within 600 yards of the target, halting to fire a volley, then advancing again at the gallop, and so on. It cannot be forgotten, however, that these results were obtained without the counteracting effects of an enemy's fire, on foot or lying down, or the advance of a cavalry command at speed, and

that if it is often doubtful whether cavalry can afford to charge infantry at speed, much less can they afford to halt and begin firing from horseback when within 600 yards of them. The act of halting to fire in the front of a charging force of cavalry, as far as I know, has had but one result, and it is scarcely worth while to discuss it.

The conclusions which I draw from the facts gathered in my reading, and from what little experience I have had during my cavalry service, may be stated as follows:

First — That mounted firing may be advisable under certain circumstances.

Second — That with reference to the carbine, it should be used only on rare occasions, mounted, as by vedettes for the purpose of signalling, or for temporary resistance by small bodies on scouting duty or advanced patrol for the same reasons, and lines of skirmishers when necessary to force back a retiring line, or to cover a retreat which was being too closely pushed, and where a charge with the saber was manifestly unadvisable. It should be used, however, with great discretion, and never used in line of battle under any circumstances.

Third — That the pistol may be made a valuable weapon for the charge in line, as it already is recognized to be for a charge as foragers, or for individual use, but that further tests must be made in actual conflict before we can concede that it is a better weapon than the saber for use in the charge by large bodies.

DISMOUNTED SERVICE OF CAVALRY.

By CAPTAIN J. B. BABCOCK,

5TH CAVALRY, BREVET MAJOR U. S. A.

I BELIEVE it to be unnecessary at this late date to consume any time in proving by reference to the exploits of modern horse, both in our country and much more recently in Europe, that fire action, dismounted fire action, is in the future to be fully acknowledged as an important characteristic of light cavalry. In the words of a distinguished English writer:[1] "The experiences of recent European campaigns have irrefutably proved that if cavalry is to be prepared to fulfil all the tasks which, without demanding too much from it, will certainly in future campaigns fall to its lot; the cavalry soldier must be able at any time to fight on foot and do it fairly well." It is, however, a fact, as we read "that up to the time of the Franco-German war the practical importance of this subject was resolutely ignored both in England and on the continent of Europe, and that only recently has it begun to meet with the full, frank recognition it deserves," and it may be useful (for a purpose to be shown presently) to consider some of the reasons why the immense advantage to be derived in making the cavalry soldier self-supporting under nearly all conditions of modern fighting, was not at once accepted in its full extent by European military authorities and writers.

First, then, we find upon the authority of Colonel TRENCH that "British and continental cavalry officers of the old school resented as long as they could the notion of turning the cavalry soldier into what they termed a hybrid creature, as being opposed to the traditions and ideas of the cavalry arm."

The glorious record of the *arme blanche;* the feeling that the soldier drilled in the use of the lance and saber and in horsemanship, should be taught to regard the saddle as invariably his proper place, and Centaur-like, to be inseparable from his horse, did much to close their eyes to the new field of enterprise opened for the cavalry corps.

Again, notwithstanding the fact that [2]"The brilliant and, in some

1. "Cavalry in Modern War,"—TRENCH.
2. Ibid.

cases, extraordinary services that large bodies of both the Federal and the Southern cavalry, fighting for the most part equally well on foot as on horseback, rendered to their respective sides, have long been matters of history;" the feeling no doubt existed to a great extent in Europe, that development in the military art could hardly be looked for in the struggle of armed citizens of the Western Republic. It was doubtless conceded that the men were brave and full of zeal in their cause, but with everything of military science to learn on the actual battlefield. Once more, the unmerited name of mounted infantry, which we still find applied to the American war cavalry in foreign text books published within three years, doubtless did much to turn away the cavalry student from a critical study of the achievements of a mounted force, which, at this late day, is beginning to be recognized as the prototype of the ideal cavalry soldier of the future. It is here that the purpose is shown in inviting your attention to the reasons why the subject of the dismounted service of cavalry advanced so slowly into favorable consideration and belief on the other side of the Atlantic. It is to point out that the novel experiences, methods, exploits and successes of the cavalry on this side were ignored, not because they failed to contain lessons and models for the future, but for reasons inherent in the prejudices and training of the cavalry leaders of Europe.

It is a matter of great regret to anyone interested in the subject that it was so; because, doubtless, the subtle flattery of imitation, and favorable criticism of military Europe, would have stimulated the cavalry leaders of our war to a careful exhibit on paper of the principles which they had so recently submitted in the field, to the test of successful experiment.

That they have not given us in detail the methods, time, conditions, etc., under which in their wonderfully successful experiments the saber was exchanged for the rifle and the rifle for the saber, with equal skill in each, is all the more to be deplored, since it appears that in 1871 General VON SCHMIDT, one of the most highly accomplished cavalry soldiers of Europe, could write as follows. Speaking in his "Instructions for Cavalry" of the dismounted service, he says: "We cannot conceal from ourselves that in the last campaign (1870-71) we appeared in the field totally unprepared in this respect." Later, in the same book, he bears testimony to the value of modern methods in the following words: "I am convinced," he says, "that cavalry would not be up to the requirements of the day if we were not able, under certain circumstances, to fight on foot, nor would it be worth the sacrifices that it costs the State. Independent and successful action of cavalry divisions is not conceivable, unless such cavalry is capable of maintaining a combat with firearms, offen-

sive and defensive, by whole regiments." Further, we find that in 1884 the English officer already quoted could still write that European cavalry had so far failed to do, what it is claimed the American horsemen accomplished twenty-three years ago, namely, to use the words of the writer referred to, "act with boldness and skill, both on foot and on horseback." It is true that since 1871, much has been written and many regulations adopted in Europe for the dismounted service, but with the exception of the Russian campaigns in Turkey, no opportunity has been granted to test their methods wherein they differ from those we cherish by tradition, from the fathers of the modern dragoon. In regard to the latter campaigns we are told by General VALENTINE BAKER "that the Russian dragoon, trained to fight on foot and horseback, did not justify the expectation formed for them," and General BAKER'S conclusion is that the Russian dragoon "is not good cavalry, and is a very bad infantry soldier." Further, to quote Captain BELL of the Eighth Hussars, "he (General BAKER) says that both Russians and Turks were absolutely deficient in scouting duties; and the rapidity and range of the infantry weapon seemed to frighten both cavalries out of all idea of vigorous action in the presence of infantry."

Again, we find that the Russian cavalry manœuvers in 1879, in the neighborhood of Warsaw, attracted a great deal of attention in the neighboring continental armies for several reasons. Among others, it was the first instance in Europe, in which a large cavalry force, engaged in manœuvers, attempted to undertake a "raid" after the American fashion, against a far distant point of the enemy's communications. I may have said enough, to show that we are the possessors, so far, of all that there is to learn from that greatest of military teachers, experience in war, in the matter of modern dismounted service of cavalry, and the kindred subject cavalry raids, made possible by the self-supporting character of modern horse. It cannot be questioned then, that it is highly important to collect the result of experience bearing on these subjects. The officers who led and served with the cavalry should tell us just when in any named battle their horsemen dismounted to fight; what were the conditions at the moment; what was the nature of the ground; how taken advantage of; what was the strength and disposition of the guard left with the horses? How did the line retire before superior infantry? How was the act of remounting covered? and many other points of tactical interest.

Surely the most instructive method of study of the important subject, dismounted service of cavalry, would be not to theorize, but to examine in the most critical detail just what has been done. It really makes no difference whatever that the experience should fit the theory, but every difference that the training should fit the experience.

Trustworthy accounts in detail of the experiments in cavalry management from which such great advantages were reaped, can be compared and recorded in tactics. As the manual for the breech-loading mechanism follows the invention, so should the tactics record the results of experience.

I will not attempt, however, in a paper prepared in the brief time at my disposal in this case, any such critical study of the partial record we already possess. I desire rather to confine myself to an examination of some of the characteristics of modern cavalry, and to the detail of a few points in our dismounted practice and tactics, which it would be well for an Association of American cavalry officers to consider and decide promptly, in view of the fact, that the recognition of the value of the lessons taught here, although tardy, is growing in strength and spreading.

The attention of cavalry students of all armies is now, very recently, invited by foreign writers, to close study of tactics, equipment, and results of dismounted fighting and "raids" in this country. It would seem that this Cavalry Association of ours has been formed just at the right time to obtain and preserve before it is too late, the information now alone possessed by our cavalry soldiers north and south, the authors of modern scouting; raiding; and dismounted fighting.

To begin then what manner of man is this modern dragoon, which the experience in the latter part of the Franco-German war, when the Franctireurs compelled the German cavalry to march under the protection of infantry, taught all Europe to look to as the model for the future? In reality the modern dragoon is in no sense a mounted infantryman. The cavalry soldier with all the confidence in his horse and saber, "the love of enterprise, and longing for personal distinction," which we are told should animate the horseman, rides in the saddle, the ever ready infantry support rides in the carbine socket. So accompanied and provided, his characteristic is, Sir HENRY HAVELOCK says, speaking of our war cavalry, "a self reliant all sufficing efficiency." He charges saber in hand the enemy at Winchester, and on foot pushes home the attack and carries the earthworks of the infantry at Five Forks. Again, he can undertake a crusade into the heart of the enemy's country with STUART or SHERIDAN, with a bouyant feeling that no Home Guard at any rate can stop him.

Surely it is apparent that modern horsemen have increased possibilities of corps distinction, when like ships of war at sea they can cruise over wide areas in search of adventure.

It was the possession by our cavalry at the close of the war of the qualities above outlined that justifies the claim made for them, that they are the only exponents so far, in recent war, of the future cavalry soldier, and that their methods deserve close study. In this I do not forget that

General VON SCHMIDT tells us "the drill regulations of FREDERICK THE GREAT for his cavalry required not only that they should be capable of holding positions and villages against an enemy, but that they should be able to master such places as churchyards, etc.," and he adds, "In this glorious period, however, cavalry lost nothing of its true spirit; they did not forget to charge with the *arme blanche*, although they had much more training in fighting on foot than now-a-days, and had frequently to attain their success by fighting in that manner." To this I submit, in support of my previous statement, that as no modern rifle existed in KING FREDERICK'S time to decimate the lines of charging horse at distances which to him would have seemed incredible, the model for future dismounted service and the possibilities before cavalry in wide sweeping raids, would not be found in a study of that great general's tactics and methods.

It may also be pointed out that PETER THE GREAT organized a corps of dragoons and gained a great victory at Pultova by their use dismounted, but they were mounted infantry in reality; their arms consisted of long muskets and sword bayonets and they carried spades and shovels for field intrenchments.

Again, the dragoons of NICHOLAS 1ST were mounted infantry. Eight squadrons of the regiments of ten squadrons were armed with muskets and bayonets and two with lances.

Having thus demonstrated, I hope, that it is the dismounted service of cavalry, not the mounted use of infantry, which we have under consideration, I invite your attention briefly to some points of tactics and equipment.

The able cavalry commander, VON SCHMIDT, has stated for us concisely a principle of our own practice, namely: "We must act with decision from the first, and as many carbines as possible should be brought into play from the commencement." This leads us to consider the question of the number of men dismounting from a troop, and the best method of holding the horses.

The German fashion is as follows: "At the command dismount, all the men of the rear rank dismount, with carbines, and all those of the front rank, who are told off as No. 1 for dismounting. Those of the front rank, who are told off as No. 2 for dismounting, remain mounted and take on their right arm the rein of the front rank No. 1 on their right, who turns his horse left about; front rank No. 2 also takes round his right arm and in his right hand the reins of the horses of Nos. 1 and 2 rear rank, which are fastened together and brought to him by No. 1."

In the French cavalry No. 2 holds the horse of No. 1 on his right and 3 and 4 on his left.

In the English service until 1883 only every other man dismounted, now in each section one man holds the horses of the other three.

Another method, proposed by Colonel BONIE, is that the horse holders should be dismounted, in which case he thinks that one man could hold six horses, including his own.

The English criticism of the American method is as follows:[1] "Against this system it is objected * * * that much time is required for linking and unlinking horses, and moreover it presents the possible disadvantage of one horse, if he breaks away, carrying with him one or two others." A careful consideration of this subject leads me to the conclusion that the objection as to time is not well taken; a few drills and practice reduces the time required to form the troop dismounted to a few seconds; fifteen seconds will do it from the command dismount.

In regard to the horses breaking away, a more serious objection of the same character exists to the European method, for should a horse-holder become disabled by a stray bullet, the horses, held separately, might disperse in three different directions, while with us three of the four would remain tied together and be more easily caught up. Another advantage which does not seem to be considered abroad is the better ability to manœuver the led horses. The awkward bunch, head to head, which the German method produces, would certainly seem to be difficult to lead; whereas we can all bear testimony that by our system the led horses can be manœuvered all over the field, at an increased gait, if necessary. It would be well, I think, to authorize the idea of dismounting the horse-holders suggested by Colonel BONIE, when by so doing better advantage can be taken of cover. It can be done at any time after the dismounted men have moved out by merely directing number four to dismount. In the rush for the horses in the remount, number four would mount first, and the confusion be less than if he stood dismounted with all the bridles in his hand, as suggested by the French colonel. I am also of the opinion that it would be an advantage if number three linked his horse to number four instead of taking his bridle over his horse's head and handing it to number four. In this way a troop of led horses, standing in column of fours, under cover, could be held in bunches of four with ease by half the number of horseholders dismounted, each one holding two bunches, the other half being available, with the carbine, on top of the bank as dismounted guard.

Another point in our tactics which we might consider to-night is whether the authority to dismount a line of mounted skirmishers, would or would not be an advantage. In that case, of course, every man should hold his own horse, and advance firing, dismounted.

Is there any lesson in the great school of experience which caused the

1. Elements of Modern Tactics.—SHAW.

movement to be left out of our tactics? The English do it, but not to the extent of each man holding his own horse. Recent experiments in this direction have been made in the 1st Cavalry, the skirmisher holding his horse at the end of a lariat, and some of our members can doubtless give us the result. That the soldier can hold his horse and fight dismounted, we have seen illustrated in Indian skirmishes; but the danger to be apprehended in civilized warfare would of course be the charge with the saber of the enemy's skirmishers, while ours were in the act of mounting or dismounting.

In one respect our tactics for dismounted service are sadly lacking, and that is in the fighting formation of the men after dismounting. We look to the details of our former experience for instruction in the possibilities of dismounted service; what it should be expected to do, based upon the story of what it did. But since our war the art of fighting infantry in dispersed order has become a special and important study. Many accomplished officers of foreign service have written on the subject, and the general principles have been formulated and universally accepted by three at least of the great European powers.

We learn among other things from Sir LUMLEY GRAHAM's statement of the general principles, the following:

First.—"The formation for battle must be such as to favor to the utmost the effect of our own fire, and minimize the damage done by that of the enemy. * * *

Second.—"For the front or firing line the only formation, both for attack and defense, which meets these requirements, is a line of small sections extended in single rank. * * *

Third.—"The firing line has a very different mission to that of the old line of skirmishers. The latter had only to prepare the way for the columns or lines; the former, on the contrary, has to fight the battle out to its very conclusion."

I find also, by reference to the[1] "Attack Formations of European Armies," that "with regard to the shooting line there is an agreement of opinion in favor of working by groups."

In the German army "each extended section of a company forms a fire group. It is under command of a non-commissioned officer and is separated by an interval from the groups on either side." In the Austrian army "each shooting line is a chain of squads (not more than seven or less than four files). Each squad has a leader of its own. The extended line has a given extent of front to cover, but within that space the squads, regulating their distance by the squad of direction, are free to act as circumstances require."

The Germans with their usual promptness to profit by their own mili-

1. Published by Intelligence Branch Q. M. D. Horse Guards War Office.

tary experience, have already incorporated the principles of infantry fighting into their directions for dismounted combat. This is what they say and teach:[1] "In order to facilitate the command of the dismounted men and the direction of the fire in broken ground, the distribution in groups must be observed, advancing by rushes from temporary cover, and turning the object to be taken from several sides, these are the principle modes of procedure that come into use." Again, the directions say: "The cavalry soldier should be able to avail himself of the advantage of the ground, surmount the obstacles it presents, gain ground by rushes, firing right up to the enemy."

The Zugs or platoons, are divided into groups of from three to five files, each led by a non-commissioned officer. "Changes of direction," they say, "are best made by the leader pointing out a particular object, feeling or intervals between groups and files being taken from the center."

It is evident that we need and should at once prepare a manual of fighting tactics for our men dismounted. We should remember what General VON SCHMIDT tell us on this point, namely, to "always bear in mind that only that which has become a matter of habit and second nature on the drill ground, should be put into execution before the enemy, as it alone can have any hope of success." Fortunately we do not, in my opinion, need any radical change in our dismounted tactics, but simply development of our present methods. Our sets of fours give us, I think, an excellent system of groups, for the shooting line, and the battalion of four troops the best fighting unit. To illustrate the following outline of a method for group fighting might be considered.

In the formation of the troop, all the non-commissioned officers, with the exception of the 1st sergeant and including the corporals, would be told off as group leaders, and so far as possible two sets of fours assigned to each. Corporals should be numbers one of sets of fours to be available for dismounted purposes.

In the dismount to fight on foot, as soon as the line is formed, the troop command, "Extend for attack," would send the line forward into a line of groups in column of threes, with deploying and group intervals, and regulating on the group of direction in the center. This would be done by each group moving out right forward, fours right, or left forward, fours left, (as it may be right or left from the center,) at the command "Extend for attack." In the forward movement each group conducted by the group leader moves in double time by partial wheels to place itself in line of deploying groups.

In the preliminary advance of the group line to attack, the firing being in this stage at long ranges, the group leaders deploy their leading threes at double intervals; the men deploy right and left on number two,

1. Instructions for Cavalry.—VON SCHMIDT.

who is the guide. The group leader follows with the rear three at five or ten yards distance. The rear three may be led by the group leaders in column of files, or deployed.

When the fire of the enemy becomes effective, say at 800 to 600 yards, the group leader may throw forward, by one movement, his rear rank men to fill the intervals, or he may, if cover is available in the direction of the advance, send the men forward by name from cover to cover.

He thus holds the group well in hand and the subdivision of command of the group line affords the captain the best means of working the deployed troop forward over the long distances that must now-a-days be traversed under hot fire. The independence of the group leaders should be controlled by the lieutenants of platoons, and by instruction and drill in the following principle, namely: To advance in the direction indicated by the troop leader until halted by him, supporting and being supported by the groups right and left, is the imperative duty of all.

The troop in support should be worked up to the front in the same manner, retaining its column formation as long as possible.

It may reinforce the firing line, either by sending designated groups forward to fill intervals or by a general movement forward of the deployed supporting groups, for the purpose of increasing the fire at critical moments.

If a third troop is employed as a reserve it should be worked close up to the fighting line as the fight progresses, and the second line becomes absorbed in the first. The firing line, having at this stage been pushed up to the limit of close, rapid, independent fire, when the roar of the breech loader drowns all sound of voice, the critical moment for assault should be indicated by the trumpet charge, whereupon the reserves deployed move forward on the run, the fighting line redoubles its fire and joins in the charge when the reserve reaches it. If unable to move the enemy the men should drop to cover, and hold on to the ground gained.

In considering the battalion of four troops as an excellent fighting unit, I would suggest that the battalion be formed for dismounted attack to the front, in line of troops in column of fours. The battalion, moving on a road in column, may be thrown forward in three lines in any direction, for attack or defense, by one command of the major.

For instance at the command "Dismount for attack front," the leading troop dismounts in column of fours and extends forward in groups, for firing line, to cover front of battalion. The second troop mounted move up on the line to right of first troop, and remaining in column of fours, dismounts, left front into line and moves out in groups in support. Third troop brings the head of column in line to left of leading troop, dismounts, "right front into line" and moves out as reserve, with a platoon in column of fours in rear of each flank of support. Fourth troop

remains mounted in column of platoons echeloned in rear of the most exposed flank of led horses, or sends a platoon to each flank. The direc tion the attack should take, or line of defense be formed, if *oblique* to line of march, may be indicated *instantly* by the major changing the direction of column half right or half left, before commanding "Dismount for attack;" the fire line troop forming and moving out on a line parallel to the front of the leading four which has turned in the new direction. For the preliminary advance, the line of led horses in column of fours moves forward, following the dismounted men, to the limit of cover. The horse holders then dismount and half form a dismounted guard in deployed groups to the front.

The horses are held close up to cover by the other half, each man holding two bunches of four, the horse of number three being linked to number four.

If cover is available the mounted troop remains echeloned in column of platoons in rear of the exposed flank. When the ground is unfavorable for mounted work the platoons of the mounted troop are sent to each flank, dismounted, and formed obliquely to line of led horses. The flanking platoons should be extended in groups at half intervals; thus the guard of led horses forms a half circle covering their charge, the men dismounted in fire groups with every advantage of cover. Depth, not front of attack or defense, being now the rule, I can see no reason why the battalion acting singly should lose time in forming a front of troops in line before dismounting to advance. The present skirmish tactics can, of course, be used when only a thin line in observation is desired.

The advantage of a system of signals by sound between the troop and group leaders is apparent. Some officers of the German army in '71 used metal whistles, and it has been strongly recommended that all be directed to do so. In my opinion the whistles should be more for the purpose of conveying information than commands.

A realistic glance at the situation would prove this, I think. Fancy a captain working forward, under hot fire, a line of fighting groups. It is impossible for him to move up and down the line, seeing everything, in the old way. Suppose, now, his flanking group breaks out of the timber to a position from which an open view is obtained, and is able to signal without loss of time: we overlap enemy; or enemy moving right or left; or retreating from this flank, etc. Certainly the difficult task of the fire line leader would be facilitated thereby.

I am of the opinion that American ingenuity can prepare a simple code of whistle signals for information, and that each group leader should be taught to use it.

To make a system of group line movements effective, the manual of

fighting tactics suggested should insist upon vigorous and frequent drills in the school of the group.

The groups each permanently assigned to a non-commissioned officer, should be repeatedly deployed and reformed on the drill ground until leaders and men are thoroughly familiar with the details of extension from the command dismount. They should then be thrown forward for drill in attack over long distances of diversified ground; being required to climb hills, pass through woods, over fences, etc.

This part of the drill should be made realistic, and instructive in the fine art of skirmishing. The group leaders should give careful instruction, for example, in regard to use of cover; pointing out that it must afford free outlook to the front for the use of the rifle, and must not delay the advance; otherwise, to seek it, is simple cowardice.

We may be encouraged to believe, by the remarkable success of the target practice, that our men could be stimulated and interested in modern methods of attack over long distances, by a judicious system of rewards and competition in physical training.

The modern soldier should be as active on foot as an Apache Indian.

Excellence in running, walking, hill climbing and long distance skirmish matches, rewarded and encouraged, would soon repay us. Quick, vigorous movement and military alertness, would become characteristic of our troops, and the half hearted performance of any drill requiring extra physical exertion, be a thing of the past.

While on the subject, I would suggest that the heavy boot now issued, be exchanged for a lighter one, and the metal clasp on the heel for the Mills spur.

The question of equipment is so closely connected with the efficiency of the cavalry for the long marches necessary for modern usefulness, that it may be considered in the question of dismounted service; as without proper equipment, the weak link in the chain, the horse's back, is likely to be used up and the trooper dismounted prematurely on the road to the battle field. In this matter we certainly have every reason to congratulate ourselves and it is due to at least two causes. One is, that in the intensely hard service of the frontier for the last twenty years, our cavalry officers have ridden thousands of miles. It is within the limit to say thousands of miles. It is safe to say, that as intelligent men of this land of invention they would be apt to discover all the defects of the horse equipments they had so constantly in use. The other cause is the fact, that of late years, the Ordnance Office has been wise and quick to receive suggestions of improvements for trial, emanating from the men who do the riding.

One further article of equipment must be provided for the cavalry man soon, and that is an implement for cutting wire fences. The extent

to which such fences are used now, will be a serious hindrance to the movement of troops in the near future.

In conclusion, I am tempted to put in a plea for the Aparejo, which has been such a good friend to many of us in Arizona and elsewhere. By its use a raiding brigade might strike out across country, almost independent of wheels and roads, and yet well supplied with rations and ammunition. The mules should be led in small trains, not herded. They could be used also, for the solution of the problem of how to supply the fire line with ammunition.

It is an American, or rather Spanish-American, improvement in transportation over rough country, and may possibly in some future war add to our honorable record as leaders in enterprise and progress for the cavalry arm.

THE FRENCH CAVALRY; ITS ORGANIZATION, ARMAMENT, REMOUNT SERVICE, SCHOOLS, INSTRUCTION, DRILL AND TACTICS.

By FIRST LIEUTENANT O. L. HEIN,

1st Cavalry, U. S. A.

ORGANIZATION.

Organization in 1870.—At the outbreak of the Franco-German war the French cavalry numbered 63 regiments. Its entire strength on the peace footing was 28,000 men, and 40,000 on the war establishment. It was divided into cavalry of the Imperial Guard and cavalry of the Line, as follows:

Guard Cavalry.—One regiment of cuirassiers, 1 regiment of carbineers, 1 regiment of chasseurs, 1 regiment of dragoons, 1 regiment of lancers and 1 regiment of guides.

Line Cavalry.—Ten regiments of cuirassiers, 12 regiments of dragoons, 8 regiments of lancers, 12 regiments of chasseurs, 8 regiments of hussars, 4 regiments of chasseurs d'Afrique, 3 regiments of Spahis.

The regiments of the Guard had each 6 squadrons per regiment. The regiments of the line, viz: cuirassiers, dragoons and lancers, 5 squadrons, one being a depot squadron. The light cavalry regiments, viz: hussars, chasseurs and spahis, 6 squadrons each, one being a depot squadron.

The strength of the larger tactical units was as follows: the brigade, 1,000 men, the division, 2,000 to 5,000 men.

The cavalry divisions, if attached to army corps, had one battery of horse artillery; if acting independently, 2 batteries.

The light cavalry, as also the dragoons of the line, were mostly armed with Chassepot carbines, having a range of 800 paces only; the lancers had, in addition to the lance and saber, pistols; the cuirassiers only sabers and pistols.

The horses of the light cavalry were mostly from Algeria; those of the remainder, principally French horses.

Within three months after the opening of the War the cavalry, in

spite of its bravery and heroic devotion, was, owing to its injudicious employment, defective organization and lack of instruction for field service, almost annihilated.

Organization in 1873.—After the close of the War the cavalry was completely reorganized and largely increased; 406 squadrons were formed, being 82 squadrons in excess of its strength at the outbreak of the war. The Imperial Guard was broken up and distributed throughout the cavalry, and the guides, carbineers and lancers were disbanded. The peace establishment was as follows: 3,369 officers, 68,240 non-commissioned officers and men; total, 71,609 officers, non-commissioned officers and men and 63,193 horses.

Organization in 1887.—During the summer of 1887 a law was passed, authorizing the creation of 13 new regiments, which, when organized, will give the cavalry a peace establishment of about 74,000 officers and men.

The cavalry (including the new formations*) is divided into 90 regiments, 19 squadrons of volunteer scouts and 8 remount companies. The regiments consist of 12 of cuirassiers, 30 of dragoons, 39 of light cavalry (of which 21 are chasseurs and 18 hussars), 6 of chasseurs d'Afrique, 3 of Spahis (native African).

The cuirassiers and dragoons constitute the heavy cavalry, the chasseurs and hussars the light cavalry. The regiments are numbered in a separate series in each subdivision of arm. The home regiments and Chasseurs d'Afrique have each 5 squadrons, of which one forms the depot squadron. In war all unserviceable men and horses in each regiment are transferred to the depot squadron, and the four remaining squadrons take the field. The Spahi regiments have 6 squadrons each, and together with the Chasseurs d'Afrique are attached to the 19th Army Corps (stationed permanently in Algeria). The Spahi regiments are, with but few exceptions, recruited from the native Africans.

The home regiments are organized into brigades of two regiments each, furnishing one brigade to each army corps, as divisional cavalry, and the remaining brigades are formed into independent brigades and divisions, constituting the independent cavalry.

The brigades of divisional cavalry each consist of one regiment of dragoons and one of light cavalry, and are designated by the names of their commanders, and the number of the army corps to which attached.

The brigades of independent cavalry (each consisting of heavy or light cavalry) are designated by the names of their commanders and ac-

*New regiments in process of formation: 27th, 28th, 29th, 30th Dragoons; 21st regiment of Chasseurs; 13th, 14th, 15th, 16th, 17th, 18th Hussars; 5th, 6th, Chasseurs d'Afrique.

cording to sub-division of arm. The divisions consisting of one brigade of cuirassiers, one of dragoons, and one of chasseurs or hussars, are designated by the names of their commanders.

Squadrons of Volunteer Scouts —These squadrons, though permanently organized, are only called into active service at a mobilization, or during the grand manœuvers. Their organization is similar to that of an ordinary squadron, and they consist of selected men recruited from unattached soldiers or reservists who have served at least one year in the cavalry. They are especially intended for outpost duty. Each volunteer, when called into active service, is required to furnish his horse, uniform and equipments. One squadron is attached to each army corps. The captains are taken from the active list, and the lieutenants from the active list or reserve. The number of troopers in a squadron is 120.

The remount companies are employed as follows: One in each of the four remount districts, one with the schools, and three in Algeria.

Organization of a Squadron.—One captain commandant, 1 second captain, 1 first lieutenant, 1 second lieutenant, 2 sub-lieutenants, 1 squadron sergeant major, 6 sergeants, 10 sergeants, 1 quartermaster corporal, 12 corporals, 1 farrier corporal, 2 farriers, 4 trumpeters, 122 soldiers, (of whom 32 are of the first class); total strength of squadron, 6 officers, 150 non-commissioned officers and men, and 144 horses.

Each regiment has five field officers, 40 officers of other grades, and 817 *non-commissioned officers and men.* On the war footing a regiment has 600 combatants, a brigade 1,200, and a division 3,600.

ARMAMENT.

The cuirassiers are armed with swords and revolvers, and each regiment is provided with sixty carbines. The dragoons, chasseurs and hussars are armed with swords and carbines, sub-officers, trumpeters, corporals and farriers have a revolver and no carbine.

Remount troopers are armed with light cavalry sabers only.

The carbine is a breech-loader (Gras pattern,) bolt type; weight 7 lbs. 11 oz., length 3 ft. 10 in., caliber, .433 of an inch. The lever is bent down horizontally. The carbine is sighted up to 1200 yards, and takes the same ammunition as the Gras rifle, with which the infantry is armed.

Revolver (pattern 1873.)—This is of the same caliber as the Gras rifle. The weight of the bullet is 180.56 grains, of charge 10 grains, of cartridge 259.26 grains. Length of barrel, $4\frac{1}{2}$ inches; length of revolver, $9\frac{1}{2}$ inches; weight of revolver, 2 lbs. 10 oz. The revolver can be cocked with the thumb on the hammer, or by pulling the trigger.

Swords are of three patterns: cuirassiers, pattern 1854, dragoon, pattern 1854, and light cavalry, pattern 1822.

The cuirassier sword, mounted, has a length of 46 inches, its weight is 2 lbs. 15 ozs., that of its scabbard 2 lbs. 3 ozs., and of the sword and scabbard 5 lbs. 2 ozs. 14 drs.

The dragoon sword, mounted, is 45.87 inches long; it is slightly curved. Weight of sword 2 lbs. 14 ozs.; of scabbard 2 lbs. 8 ozs. 12 drs.; weight of scabbard 2 lbs. 3 ozs. 4 drs.; weight of sword and scabbard 4 lbs. 12 ozs.

The light cavalry sword is more curved than that of the heavy cavalry. Its length, mounted, is 43.3 inches. Its weight is 2 lbs. 8 ozs. 12 drs.; weight of scabbard 2 lbs. 3 ozs. 4 drs.; weight of sword and scabbard 4 lbs. 12 ozs. The weight of the helmet (steel with black horse-hair mane) is 2 lbs. 6 ozs. The cuirass (worn by cuirassiers) is of steel, and has a breast plate and back piece. Its weight varies with the size of the man, from 15 2 lbs. to 13.4 lbs

Melenite Petards.—Every trooper when ordered on reconnoitering duty receives a melenite petard, which is carried in a special compartment in the saddle bags. The petard consists of a tin case containing 3.1 ozs. of the explosive. It is exploded by means of a fulminate, cap, and fuse, and is used for the rapid destruction of railways, telegraph lines, bridges, tunnels, &c. It is said that the explosion of two petards upon a steel or iron rail, will be sufficient to make a rupture from 16 to 19 inches long. The explosion of 5 petards upon 2 non-consecutive railway ties will make a rupture 2 yards long. With 3 petards an engine or tender may be disabled; and with 15, a breach 4 feet long can be made in a wall $\frac{1}{2}$ foot thick, and with 8, any field gun may be disabled.

On raiding expeditions, a great amount of damage can be done by means of this explosive, with great rapidity and safety.

REMOUNT SERVICE.

France is divided into four districts for general remount purposes, and Algeria into three districts.

Each district is commanded by a colonel or lieutenant colonel unattached, who is under the direct orders of the War Minister, in all that relates to the purchase of horses. There is an inspector general at the head of the remount service, and an assistant inspector general, the former a general of division and the latter a general of brigade. Each district contains four or five remount depots; the latter are commanded by chiefs of squadron, assisted by a number of captains and lieutenants of cavalry, a veterinary surgeon, an executive officer, and a detachment of remount troopers.

The remount depots are under the jurisdiction of the Generals commanding the Army Corps districts in which located, as regards discipline and police, but in all that relates to the remount service proper they are under the exclusive control of the commanders of the remount districts.

The purchase of horses is regulated by the War Minister, in accordance with the political forecast and the exigencies of the service. Purchases are made in public by committees, each consisting of a chief of depot, two other remount officers and a veterinary surgeon. These officers receive a daily allowance of $2.00 while purchasing horses, besides their remount pay. Only geldings and mares (except those with foal) are eligible for army use. They must be of French origin, 4 years of age, free from vice and sound, have flowing manes and tails and come up to the standard, which is 15 hands $\frac{1}{2}$ in. to 15 hands 3 in. for cuirassier horses, 14 hands 3 in. to 15 hands $\frac{1}{2}$ an in. for dragoon horses, and 14 to 14$\frac{3}{4}$ hands for light cavalry horses.

The horses presented to the board are examined, and are accepted if a majority favor it. Each officer submits his written opinion on every horse presented, together with its money value, if he favors its acceptance. These written estimates are handed to the president, and the dealer is then informed of the price, which is the average of the three prices. A special register is kept of all horses purchased, and each officer is also required to record in his note book his opinion of the horses accepted, together with the price he has himself suggested in each case. The registers and note books are submitted to the inspector general of the remount service yearly for his examination, to enable him to judge of the qualification of the officers for this special duty.

All horses purchased are kept on probation for a period of from nine to thirty days before final acceptance.

The horses, upon arriving at the depot, are branded on the feet and divided into two classes—officers' chargers and troop horses. They are retained at the depot for a certain length of time for acclimation, dieting and preliminary training.

The prices paid for horses of the different sub-arms are as follows:

For officers' chargers, $240.

For troop horses of cuirassiers, $200.

For troop horses of dragoons, $180.

For troop horses of light cavalry, $160.

For riding school horses, $340. (Trained principally for general officers.)

Mounting of Officers.—Officers are furnished with chargers by the State, either gratuitously, on payment, or temporarily.

Cavalry lieutenants, surgeons attached to cavalry regiments and veterinary surgeons are furnished with one horse gratuitously, and captains of cavalry two horses. A general distribution of horses takes place annually on the 1st of April, when officers are allowed to choose from all horses in the regiment (except those assigned to troopers), and from the young horses arriving from the depots, provided they are at least 5 years old and suitable for squadron horses. Officers are responsible for

the good care of their horses, and if the latter break down or are injured through neglect, are required to reimburse the government by paying an amount equal to the seventh part of the cost price, increased as many times as the horse would have legal years of service remaining. Officers are forbidden to lend or drive their chargers. Captains of cavalry, promoted to field officers, are allowed to retain their horses by paying an amount equal to the seventh part of the cost price of the horse, increased as many times as the latter has legal years of service remaining. Field and general officers are allowed to purchase horses at cost price.

INSPECTIONS.

The cavalry regiments, remount and veterinary services and cavalry school of application are arranged or distributed in 14 inspection districts, with an Inspector General of Cavalry (general of division or brigade) in charge of each district.

TERRITORIAL CAVALRY.

There are 19 regiments of Territorial Cavalry, each consisting of 4 squadrons, 2 of dragoons and 2 of light cavalry.

The cadres of these regiments are permanently formed, but the men are allowed to remain at their homes and have no duty whatever in peace time, except the yearly muster. The organization of a territorial squadron is similar to that of an active squadron. The territorial squadrons are mobilized at the stations of the active regiments, of the same subdivision of arm.

SCHOOLS.

Regimental Schools.—Each regiment of cavalry has 3 schools; the 1st is on the principle of mutual instruction and is called the school of the 1st degree; the two others are termed schools of the 2d and 3d degrees.

In each squadron the captain commanding is entrusted with the direction of the school of the 1st degree. He causes the officers to superintend the instruction, and appoints sub-officers, corporals and educated soldiers, as teachers. These teachers receive no extra pay. The school is held in the squad-room. For the schools of the 2d and 3d degree the colonel appoints at least 3 professors, of the rank of lieutenant. The same subject can be taught by one professor in both schools.

In each regiment the colonel appoints a captain director, who has under his orders a clerk, to take charge of school property and to do clerical work, and to look after the sub-officers' library. The captain director and the officer professors form a board of examiners, which is presided over by the lieutenant-colonel of the regiment; the latter being in charge of all the schools. The instruction in the school of the 1st degree comprises reading, writing and the first four rules of arithmetic. It is obligatory for all soldiers who are ignorant of those subjects. A

special syllabus, prepared for the use of soldiers, is alone used in the regimental schools. One hour at least, daily, is given to the school of this degree, which in winter is increased to two hours.

The instruction in the school of the 2d degree comprises: grammar, arithmetic, general notions of geography and practical notions of the minor operations of war.

The school is intended for corporals recommended for promotion, farriers, sergeants, and one year volunteers. There are two classes a week, each of an hour and a half in duration. At the end of the year those pupils who have attained sufficient knowledge, are excused from further attendance.

The instruction in the school of the 3d degree comprises: exercises in French (dictation and composition,) arithmetic, history of France, geography, elements of plane geometry, map reading and instruction in topography, and field fortification.

There are three classes a week, each of an hour and a half; there are besides two attendances for study, of an hour and a half each.

This school is voluntary and is reserved for sergeants and one year volunteers. No sergeant can be recommended for promotion to the rank of sub-lieutenant unless he has passed successfully through the school of the 3d degree, or gives proof of possessing the knowledge required by the prescribed programme. The colonel fixes the hour at which the school is held and a quarterly report of the progress of the school is made by the lieutenant colonel. The captain director does not interfere with the school of the 1st degree, but the officer professors are under his orders, and he superintends the instruction given by them. He reports to the lieutenant colonel all matters concerning the school of the 2d and 3d degree.

Instruction in fencing is obligatory for both officers and men, and is under the general supervision of a field officer of the regiment, who has a 2d captain or lieutenant under his orders in special charge of the school of fencing. The instruction in fencing is given by a specially trained sergeant with a number of assistants.

Special Military School of St. Cyr.—The Special Military School of St. Cyr has for its object the the training of cadets for the infantry, marine infantry, and cavalry. The course lasts two years. Admission is by competition. Pupils are admitted between the ages of eighteen and twenty. Sergeants, corporals, and soldiers who have completed two years service, are allowed to compete to the age of twenty-five.

The pupils, 750 in number, are organized in companies and form a battalion. Those, who at the end of the 1st year, are intended for the cavalry, are formed in a section by themselves.

The staff of the school consists of: a general of brigade, commandant,

a colonel 2d commandant, seventeen infantry officers (instructors), and nine cavalry officers (instructors).

Nearly all the professors are military officers, seven only being civilians. The studies are under the supervision of a director, a superior officer, who is assisted by two sub-directors of studies.

All interior matters of discipline are settled by a council of discipline, formed from the staff of the school.

After the final examination, lists are prepared, according to merit, of all those qualified for commissions in the infantry and cavalry. A certain number of those highest on the list are allowed to compete for the staff school.

Those assigned to the cavalry are sent to the cavalry school at Saumur.

Pupils who fail to pass may be placed in regiments as sergeants or corporals, if they have served the time which is necessary for promotion to these grades. The time passed at school counts as service.

School of Application at Saumur.—The School of Application for the cavalry at Saumur, has been instituted with the following objects:

First.—The instruction of a certain number of cavalry and artillery lieutenants who are sent to it each year.

Second.—The post graduate education of the "cavalry cadets," of St. Cyr, all of whom are compelled to enter it after their graduation at St. Cyr, and before being assigned to regiments.

Third.—The instruction of such non-commissioned officers of cavalry as are intended for promotion to second lieutenancies in that arm.

Fourth.—Completion of the practical instruction of newly appointed assistant veterinary surgeons.

It contains also a department of optical and electrical telegraphy for certain non-commissioned officers and privates of cavalry, and a school of blacksmithing for the education of regimental blacksmiths.

The course for all except the telegraphers lasts eleven months.

The composition of the school is as follows:

1st Lieutenants of cavalry	36
1st Lieutenants of artillery	19
2d Lieutenants of cavalry (unassigned)	71
Non-Commissioned officers	85
Veterinary Surgeons	31

The 1st lieutenants of cavalry and artillery (known as "officiers d' instruction") enter the school directly from their regiments, and are chosen (on recommendation of regimental commanders to the general of each army corps), as officers who are fitted by their aptitude, intelligence and industry, for promotion, in the event of their creditable standing at the school. The conditions are that they shall not be over 31 years of

age, and must have served at least two years as 1st lieutenants. At the end of the course these officers are classed according to their marks; those comprised in the first half are borne on the "roll of promotion," and are entitled in the order of their merit to the first vacancies of captaincies occurring in their arm; the lower half receive no advantage in the way of promotion. "No. 1" of each class, and if the class be a large one "No. 2" also, is recommended for an immediate captaincy. The lieutenants of artillery are sent to the school principally with the view of fitting them for "instructors of equitation" in their batteries. They are borne on a separate list in reckoning their standing, though their course is the same as that of the cavalry officers.

The course for all the "officiers d' instruction" is as follows:

First.—Theory and practice of cavalry manœuvers in France and abroad.

Second.—Equitation.

Third.—Hippology, including anatomy, science of breeding and practical surgical operations, system of purchasing remounts, shoeing and study of horse equipments used in France and abroad. These last two subjects are studied with much advantage in the blacksmith shops and saddle factories of the school, the largest military ones in the world.

Fourth.—Military art, including French military organizations and the principal military laws of France, history of cavalry from antiquity to modern times, tactics of the three arms, practical marches of cavalry, acting independently and in conjunction with other arms, adapted to various sorts of ground.

Fifth.—Topography; study of the principal compasses and other instruments used in France and abroad, ink etching, sketches of country traversed on horseback, map work in colored crayons. (Practical and rapid.)

Sixth.—Field fortification; knowledge of different sorts of field works, defence of inhabited places and advantages to be taken of different sorts of natural positions, practical elements of military telegraphs, employment of explosives, etc.

Seventh.—Artillery; knowledge of material of service, effects of fire, service of piece, military bridges, armament of foreign powers.

Eighth.—German. Besides the above are taught fencing, gymnastics, and target practice (carbine and revolver).

The standing of each officer is determined by weekly interrogations and quarterly examinations, while recitations from the text are always required. The maximum in each recitation is 20. To pass the school with a recommendation for promotion, each officer, even though he be in the first half, must have an average of 12 in equitation and military instruction, and 10 in general instruction.

This average seems low, but the system of marking is severe, equally so as at West Point, and the course is extensive besides. In computing the general standing at the end of the year the marks are given under 4 different heads, as follows: Conduct, 10; practical equitation, including hippology, 33; military instruction, practical part, 33; general instruction, 33.

Of these marks the ones for conduct are given personally by the commandant of the school, the others by examining committees.

It will thus be seen what a preponderance is given to the marks relating to equitation and the study of the horse. It is, in fact, the expressed desideratum of the school to make of the officer a horseman and leader of cavalry, and all the other instruction of the school is subordinated to these objects.

The 2d lieutenants from St. Cyr constitute a division entirely separate from the 1st lieutenants, as far as all instruction goes. Their course comprises equitation, and theoretical and practical knowledge of the horse, military art and history, practical manœuvers of cavalry in the field, German, target practice, topography, elements of artillery, tactics, fencing and gymnastics.

The course for the non-commissioned officers is the same as for the 2d lieutenants, except that it is more elementary in military art and tactics, and has the addition of military geography.

The Cadre of the school is as follows:

Permanent Staff.—One general of brigade or colonel, commandant; 1 colonel or lieutenant colonel, 2d commandant; 3 majors, 1 quartermaster, 1 paymaster, 1 assistant quartermaster, 1 assistant paymaster and 7 clerks.

Military Instructors.—One chief of squadron, principal instructor, and 5 captain and 7 lieutenant instructors.

Riding Masters.—One chief of squadron, principal instructor, and 4 captain and 7 lieutenant instructors.

General Instructors.—One chief of squadron, director of studies and professor of military art and topography; 1 captain, assistant instructor; 1 lieutenant, professor of history and military geography; 1 captain, professor of fortification, and science applied to military art; 1 captain, professor of German; 1 captain professor of telegraphy; 3 surgeons and 3 veterinary surgeons.

There are also a large number of non-commissioned officers and soldiers included in the permanent effectives of the school, for the riding hall, hospital, saddle factory, gymnasium, etc.

The military duty, guard, fatigue, etc., are performed by two squadrons. From these are taken the orderlies of the officers and non-commissioned officers. The non commissioned officers on entering the school are

given a distinctive uniform, are entitled to salute from all enlisted men except the non-commissioned staff and sergeants, and are provided with orderlies — one for every two. This last provision seems natural when it is recollected that they receive their promotion immediately on the completion of their course at school.

The effective of horses at the school is at present as follows:

Riding-hall animals	150
Cavalry horses, 1st class	210
Cavalry horses, 2d class	230
Draught horses	8
	598

Adding to these 200 horses in process of training at the school, and the government horses which the instruction officers and non-commissioned officers bring with them from their troops and batteries, the total of horses is 918. All the riding hall animals proper are imported English thoroughbreds, which are very carefully trained and cared for at the school. One of these horses is assigned to each officer on his arrival, and is ridden by him in the riding hall exercises, during the morning or afternoon hours of each alternate week. During the remainder of the time the cavalry horses of the first and second classes are employed for these exercises, and are chosen by the officers at random. The delicate management required in the training of these thoroughbreds forms a beneficial portion of the officers' instruction, and receives the greatest care from the riding masters. There is a school of "training" attached to the general school, which has for its object the breaking and training of the difficult horses sent each year to the school by the different regiments, and the exercising of the officers in this art. The blacksmithing school is of the greatest practical advantage. A certain number of men are annually sent from the cavalry regiments, and during the year are fully instructed in all the details of theoretical and practical blacksmithing, especially the horse-shoeing. The course of veterinary surgery seems to be most complete. The "assistant veterinary surgeons," on entering the school, sign an engagement of service for six years. The days' duties for all connected with the school begin at 6 A. M., and end, according to circumstances, at from 4 to 6 P. M.

The following is the programme for the different days:

Mondays, Wednesdays and Fridays.— Six A. M. to 8. A. M., riding hall exercises; 8:30 to 10 A. M., recitations; 12:30 P. M. to 2:30 riding hall and training school for horses; 3 to 4:30 P. M., first, recitation, fencing afterwards.

Tuesdays and Thursdays.—6 A. M. to 8 A. M., riding hall; 8:30 to 10 A. M., recitation or target practice; 12:30 to 3 P. M., mounted drill, including saber exercise, leaping of bars, ditches, walls, on steeple course;

3 to 4:30 P. M., recitation, often followed by work in one of the annexed schools till 6 P. M.

Saturdays.—Six A. M. to 8 A. M., recitation upon field service of cavalry, including reading of notes upon reconnoissances, marches of advanced and rear guards, and a discussion of the practical problem in each service given out for the day; 8 to 10, riding hall; 12 M. to 6 P. M., practical service of reconnoissance, etc., (practical solution of the morning problem). Occasionally this problem is given out on Friday, and the whole of Saturday is given to this practical work. In this case the start is made as early as 5 A. M., each officer carrying his breakfast in his saddle-bag.

The officers d'instruction are divided for the purpose of military exercises into two permanent divisions, each under command of a captain. They are often employed as two opposing bodies of troops in simulating the actual operations of war, and sometimes combined when there is need of a large body. They thus form two companies, by which, singly or combined, all the principles of war can be practically demonstrated, from the march of an army corps to that of a reconnoitering squad. The second lieutenants and non-commissioned officers perform, in addition to their school duties, those of ordinary garrison routine, like the officers of our Leavenworth school. They are both in barracks and are required to keep certain hours, and subject to a considerable degree of discipline. The first lieutenants under instruction are exempt from all duties, save the drills and studies pertaining exclusively to their course. They are quartered in lodgings in town at their own expense. All of the officers of the school are bachelors and are required to mess together. This arrangement is supposed to foster "bonne camaraderie," render the living cheaper, and prevent any feeling of humiliation on the part of the poorer officers, who cannot afford to keep expensive establishments. All officers preserve after their arrival at the school the uniform of their respective regiments and corps. For the riding exercises, however, there is prescribed for all a dark blue "culotte," tight-fitting at the knee and very loose above, so made as to leave the greatest liberty to the limbs on horseback, a close-fitting boot and nickle spurs. All of these articles are eminently neat and practical. The "culottes" save clothes, and with the rest of the dress, have a very military air.

The etiquette in dress is very strict. Everyone appears in boots in the morning and wears them at all exercises, until the duties of the day are over; they are never permissible in the evening at dinner. Spurs are always worn, and no officer leaves his quarters in the afternoon after four o'clock without the saber; gloves are equally obligatory in the afternoon promenades. It may be proper to remark that the system of instruction in the school since the war of 1870 has, like that in the other branches of the military service, undergone a great change. The

entire revolution in their tactics since that date has involved a different course of study, and the work pursued in the school is of the most earnest and unremitting kind. Neither precept nor example is lacking on the part of the superior officers to maintain this. The Commandant of the school attends, in all sorts of weather, the opening of the riding hall at 6 A. M., and is seen constantly during the day at the various exercises. There are four immense riding halls at the school, three of them being larger than that at West Point, and four large stables. The latter are built of stone and are said to be the most perfect models of stables in existence.

Preparatory Cavalry School at Autun.—This school was established in 1886, its object being the education of boys for the grade of sergeant of cavalry. The cadre of the school is as follows: One chief of squadron, commandant; 1 captain commandant, 2nd commandant; 3 lieutenant instructors; 1 paymaster; 1 administration officer; 1 doctor; 3 sergeant major instructors; 6 sergeant instructors; 13 corporal instructors; 1 sergeant fencing master; 1 sergeant gymnastic instructor. There are besides a number of non-commissioned officers, trumpeters and troopers employed as clerks, workmen, etc.

The personnel of civilians consists of 1 professor and 10 assistant professors. The refectory, laundry and hospital are under the charge of 8 Sisters of Charity.

The number of pupils at the school is 500. The age of admission is 13, and the boys graduate just as they reach the minimum age for enlistment. They sign an engagement to serve in the army for a period of seven years.

The course of instruction lasts five years. The school is divided into five classes. The first comprises the boys of 17 years of age, the second those of 16, the third those of 15, the fourth those of 14, and the fifth those of 13. The boys are organized into three squadrons, each under a lieutenant instructor, who commands, instructs, and administers his squadron, the duties being similar to those of a captain in a regiment. He has under his orders as assistants 1 sergeant major, 2 sergeants, 4 corporals, and some chiefs of squad, selected from those boys in the squadron who are most distinguished for their military bearing, soldierly conduct and capacity for command. The course of instruction comprises:

First.—Primary instruction, reading, writing, arithmetic, elements of geometry, land surveying, leveling, the elements of physical and natural sciences, history and general geography, German, vocal music and landscape drawing from nature.

Second.—Military instruction, which embraces the school of the trooper, platoon and squadron, garrison and field service, elementary

course in fortification, topography, artillery, administration and accountability, the application of the physical sciences to railways and telegraph lines from a military point of view, a course in hygiene.

The programme of the course in gymnastics, fencing, boxing and Indian clubs is prescribed in orders from the War Office.

All the pupils wear a military uniform, and those of the first and second classes, spurs, and are armed as light cavalry.

The main object of this school is not only to give these boys a good primary, general and military education, but also to inculcate in them a high sense of honor, patriotism and good fellowship. Each year 100 of the pupils are distributed among the different cavalry regiments, and of this number more than two-thirds are expected to make good non-commissioned officer instructors. It is believed that this preparatory school, now in its infancy, will give the best results, and will furnish the cavalry regiments with good sergeants.

INSTRUCTION.

The instruction of the cadres and troopers of the French cavalry is considered the most important part of their service, and all other duties are subordinate to it. The instruction year is divided into four periods, each of which closes with an inspection.

First Period.— Lasts about six months, and is wholly devoted to individual instruction, and comprises: School of the trooper, mounted and dismounted, theoretical instruction in the elements of garrison and field service, preparatory instruction in fencing, care of arms, vaulting, gymnastics, including running, jumping, use of parallel bars, boxing, etc. The inspection of this period is made by the colonel of the regiment.

Second Period.— Extends from April 1st to June 1st, and comprises: The school of the trooper mounted (with arms), school of the platoon mounted, platoon and squadron drill dismounted, and theoretical instruction in garrison and campaign service. This period, during which the recruit becomes a soldier, is considered so important that its inspection is made by the brigade commander.

Third Period.— Begins on June 1st and ends on July 15th, and comprises the school of the squadron mounted and a continuation of the practical lessons in field service. As the regimental drill can only begin, with advantage, after the instruction of the squadron has been completed, the colonel makes the inspection of this period himself, requiring each squadron, after going through the various evolutions, to perform a practical operation in field service.

Fourth Period.— Begins about the middle of July and ends on the 1st of September, and comprises the school of the regiment, practical exercises in field service and the different branches of instruction left un-

finished at the end of the third period, such as the training of the young horses and the practical exercises of the cadres. The inspection of this period is made by the division commander or the division inspector general.

The instruction of the recruits in horsemanship, only begun in the first year, is continued during the remaining years of their service. Owing to the great importance attached to riding drills without arms, as much time is devoted to the old soldiers in these exercises as to the recruits, the captains regulating the period of individual mounted instruction, so that the old soldiers and recruits are ready to begin the squadron drill together.

Practical instruction in field duty, the object of which is to train the troopers in their duties in war and to cultivate their individuality and intelligence, is given as often as possible on varied ground. The drills and field exercises go hand in hand throughout the year, each receiving an equal amount of attention.

Drill Regulations.—The drill regulations of the French cavalry were published in 1876, revised and completed in 1882, and consist of four parts. 1st. Basis of instruction, 137 pages. 2d. Dismounted instruction, 65 pages. (The length of the quick step is 29½ inches and cadence 115 per minute; the double step 31½ inches and cadence 170 per minute.) 3d. Mounted instruction, including the regimental evolutions, 207 pages. 4th. School of the brigade and division, 160 pages.

The practical instruction for cavalry field service was published by the War Office in 1884. It is divided into two parts. Part 1 gives the principles and rules for cavalry field service, and Part 2 explains the method of applying these principles and rules on the ground. The subjects treated of, are: general definitions, orientation, definitions relating to the ground, reconnoissances of the ground, indications, written orders and reports, execution of marches, march of an isolated squadron, squadron as advance guard and rear guard, reconnoitering, establishment of cantonments, bivouacs and camps, and the duties pertaining to each, police and picket guards, outposts, subsistence of troops in the field, requisitions, minor operations of war, distributions, provost guard duty, safe guards.

The platoon is formed in double rank and consists of twelve files, including a non-commissioned officer on each flank and one in the center of the front rank. The platoon leader is the guide and is posted 1½ paces in front of the center of the platoon. Commands may be given in three ways, either singly or combined, namely, by the voice, by gesture and by the direction and gait of the horse, but every well-instructed platoon must be able to follow its leader without commands. In the direct march in line the corporal in the center of the platoon follows accurately in the trace of the platoon leader and preserves a distance of 1½ paces from him.

The troopers all dress toward the center, keeping slight intervals to secure ease in the ranks. In open order the distance is 6 paces. In the route column the guide is 1½ paces in front of the center of the leading four. This column is always formed by breaking to the front from either flank.

The dismounted combat of a platoon is conducted as follows: At the command "Fight on foot" the troopers halt and dismount, with the exception of No. 2s. In dismounting, the guide, front rank, and Nos. 1 and 3 of the rear rank move forward; the guide and Nos. 1 and 3 of the front rank two horses' lengths, the others one horse's length. The Nos. 2 and 4 of the rear rank stand fast. All the troopers then dismount, with the exception of the No. 2s.

Numbers one and three hand their reins to number two, and numbers four link their horses to those of number three. Numbers one, three and four then take their cartridge boxes from the right saddle bags, pass them over their shoulders and move rapidly to the front, forming in two ranks.

If a smaller number of dismounted troops is required, the numbers two and four dismount, and pass their reins to numbers one and three, who remain mounted.

The platoon leader designates the support and moves his dismounted men to the front at the double, and deploys them as skirmishers with two paces intervals, and with the guide center. The led horses are conducted to the rear by a non-commissioned officer. The skirmishers are taught the principles of attack and defense, fire discipline, to take advantage of cover, and commands are given by the voice or by the whistle, and no trumpet signals are allowed except for the "Assault." At the signal "Rally," the led horses are brought up to the platoon, or to a point indicated by the leader, when the men regain their horses rapidly by the shortest route, sling carbines and mount. If the support has not been deployed, it forms in rear and delivers fire, while the men are regaining their horses. The route column may also be dismounted to fight.

The squadron consists of 48 files, (first-class troopers in the front rank). The captain is posted ½ squadron length in front of the center of the squadron. The four lieutenants 1½ paces in front of the center of their platoons. The 2d captain 3 paces in rear of the center of the squadron. The four senior sergeants are 1½ paces in rear of the center of their respective platoons, and the remaining sergeants and corporals are on the flanks of the platoons and counted in the fours. When the captain commandant gives a command his saber is raised vertically, and lowered similarly at the command of execution. The chiefs of platoon have their sabers drawn only when the men carry theirs. In the direct march in line, the captain commandant is guide, and the chief of the 2d platoon regulates his march so that the center of the squadron will always be at the prescribed distance from the guide and directly in his

trace, the other platoon leaders regulate on the leader of the 2d platoon and the file closers see that the corporal in the center of each platoon marches accurately in the rear of the platoon leader. If the squadron leader leaves his place in line, he indicates the point of direction to the chief of the 2d platoon, when the direction of the march devolves upon the latter.

Column of platoons may be formed from line, to the right or left, or to the front. In this formation the captain commandant, when guide, is half a platoon front, in front of the leader of the first platoon. Line may be formed from column, to the front, to the flank, or obliquely to the flank. As a rule, all deployments, in which the platoons have unequal distances to pass over, are executed at a rapid gait, and the platoons move to their places by the shortest route. The usual drill pace of the squadron is the trot, but it is frequently drilled over long distances, at a fast gallop. The paces of the cavalry are, as follows:

	Walk.	*Trot.*	*Gallop.*	*Fast Gallop.*
Light Cavalry,	110 yds per minute.			
Line "	120 " "	262 yds per minute.	371 yds per minute.	481 yds per minute.
Reserve "	130 " "			

The charge of the squadron is executed in line or in column, in close or extended order. The enemy is always marked by four troopers supervised by a non-commissioned officer, arranged so as to represent the four chiefs of platoon of an opposing squadron. To execute the charge the captain causes sabers to be drawn, and passes to the gallop at 700 or 800 yards from the enemy. Before reaching the point from which he wishes to make the charge, the squadron leader commands "Attack," and does not command "Charge" until the squadron has arrived within 50 or 60 paces of the markers representing the enemy. At the command "Charge," which is repeated by all the lieutenants, the squadron charges sabers and increases its gait to the greatest speed consistent with the control of the horses. The charge from column is only made when there is neither time nor space for deploying, or when it is desired to break the enemy's line at some point at any cost. The charge as foragers may be executed from line or column, and may be combined with a charge in compact order. It consists of the dispersion and charge, and the enemy is represented as before, but the markers have an increased interval. At the command "As foragers charge," the troopers take the gallop and disperse in a fan-shaped order, upon arriving at 100 paces from the markers the charge is sounded. After charging from 150 to 200 paces, the squadron rallies rapidly upon the squadron leader.

Preliminary to every charge, ground scouts and combat patrols are pushed out 200 yards rapidly to the front and flanks to reconnoiter the ground and obtain quick intelligence of the movements of the enemy. In the attack the role of the scouts is considered most important, and their employment is never omitted.

In the dismounted combat of a squadron 3 platoons are generally dismounted to fight, one forming the support. The 4th platoon remains mounted and acts as reserve. The squadron leader commands the dismounted men, and a lieutenant the led horses.

School of the regiment.—The regiment of manœuver consists of 4 squadrons, the squadron interval is 12 paces. The squadrons are numbered from right to left; the 1st and 2d constitute the right wing, the 3d and 4th, the left wing; each commanded by a chief of squadrons. The posts of the officers in line are as follows: The colonel, when acting as guide of the regiment, $\frac{1}{2}$ squadron front in advance of the captain of the squadron of direction; the captain instructor behind him; the 2 sergeant majors, chief trumpeter and colonel's trumpeter, in rear of the captain instructor; the lieutenant colonel to the left and a little in rear of the colonel; the chiefs of squadrons, in front of the center of their wings, in line with the captains commandant. The standard is on the left of the 4th platoon of the 2d squadron.

The line formations of the regiment are as follows:

First.—The line of battle, in which the normal squadron interval is 12 paces. This order is especially employed in the charge, and is also used when the regiment is obliged to remain motionless and exposed to artillery fire.

The regiment wheels at all gaits, and always on a movable pivot.

Second.—The line of platoon columns, in which the squadron interval is equal to the front of a squadron in line. The line of platoon columns possesses great mobility, and can be used with advantage on varied ground. It admits of a rapid deployment into line of battle, and is regarded the best preparatory formation for attack.

Third.—The mass formation, which is the same as the line of platoon columns, with the interval reduced to twelve paces. The mass occupies but little space, comparatively speaking, and can be manœuvered and deployed with great facility.

The column formations are as follows:

First.—The column of platoons with squadron distances of eighteen paces. The field officers and the captain commandant, except the first, march on the flank of the column. The colonel, when guide, marches one-half squadron front in advance of the captain of the leading squadron. From the column of platoons may be formed the three orders in line, either parallel, perpendicular or oblique to the column.

Second.—The double column, consisting of the two half regiments, in column of platoons side by side, with an interval of twelve paces.

Third.—Column of route.

The charge of the regiment is executed in the same general manner as that of the platoon and squadron. The colonel and the officers and

non-commissioned officers and trumpeters who accompany him, place themselves in the center of the regiment, in line with the company officers.

For the peace manœuvers the general rule is to begin the attack at the walk, then pass to the trot, which is continued for about 1,000 paces, then commence the gallop, which is kept up for 600 paces, or in the attack of infantry for 800 paces, then charge for about 80 to 100 paces.

Evolutions of the Brigade.—The brigade of manœuver consists of two regiments and one battery of horse artillery.

The line formations are: The line of battle, the line of platoon columns, and the line of masses.

The column formations are: The column of masses, the column of squadrons at full or half distance, the column of platoons, the double column and the route column.

When the brigade is in line formation the squadron of direction is usually the 2d squadron of the 1st regiment. The general of brigade is half squadron front in advance of the colonel of the 1st regiment.

Evolutions of the Division.—The division of manœuver consists of three brigades and three batteries of horse artillery.

The line formations are: The line of battle, the line of platoon columns, the line of masses and the line of brigades in columns of masses. The column formations are: The column of squadrons, the column of platoons, the double column and the route column.

In line, the direction is taken from the regiment of direction of the center brigade.

TACTICS.

Tactical Employment of Cavalry.—In the field service of the French cavalry, other than its action on the field of battle in conjunction with the other arms, the duties of scouting and gaining intelligence of the enemy (service d'exploration,) and those of insuring the safety of the army (service de securite,) are separate and distinct, and entrusted to different corps, the former to the independent, and the latter to the divisional cavalry.

The role of the independent divisions covering the army, consists in screening the movements of their own army, whilst endeavoring to discover those of the enemy, thus forming the strategical advanced (or rear) guard of the force they cover.

Each independent division provides for its own safety on the march, by an advanced-guard, flanking parties, etc., and at a halt, by outposts.

Its explorations are made by discovery patrols, each consisting of an intelligent non-commissioned officer and from 2 to 6 troopers, pushed 2 or 3 days ahead of the advanced contact squadrons, their mission being to thoroughly reconnoiter the country and cover the division on the march;

and officers' patrols consisting of an officer and 2 or 3 picked troopers, pushed still farther ahead, either upon some special mission or to gather what information they can of the enemy. These scouting parties and officers' patrols are allowed great freedom of action for reconnoitering purposes, and are quite independent of the main body.

Each division generally furnishes 2 contact squadrons for this duty, two platoons of each squadron performing the patrol duty, with the remaining two platoons in support. Thus with 16 patrols of 6 men, each covering a front of 2 miles, the division would explore a total front of 32 miles. The main body (the remaining 21 or 22 squadrons and the horse artillery) follows in rear under the immediate orders of the division commander. While at a considerable distance from the enemy, 40 miles or more, the division marches on several roads, 3 if possible, with the cuirassier brigade in the center and a little in the rear of the other brigades, one contact squadron being detached from each. Upon nearing the enemy, the division contracts its front, and marches on 1 or 2 roads, employing a contact squadron for the line and light brigades in the first case, and in the second case, one squadron from the leading brigade. Connection with the army is maintained by the brigades of divisional cavalry.

The brigades of divisional cavalry are charged with the service of security, which, as a rule, is restricted to a comparatively limited zone. Each brigade is disposed in 3 lines:

First, scouts; 2d, supports, consisting of groups of squadrons 2 or 3 miles in rear of the 1st line; 3d, the reserve, consisting of the 2d regiment of the brigade, 2 or 3 miles in rear of the center of the 2d line and under the immediate orders of the brigade commander. The main purpose of this arrangement, is to secure a curtain or screen, through which nothing must be allowed to pass. This 3 line formation though unsuitable for the service of exploration, is considered to be the best for the service of security, for the echelons being quite near the main body, can readily find shelter within the infantry lines, and their role not being an offensive one, rapidity of concentration is not so urgent as in the case of the independent cavalry.

When the division forms for combat it is distributed in three lines of echelons, with the center in advanee. If the division consists of two brigades only, one forms the first line, and the second the second and third lines. As a rule, the brigade of cuirassiers is posted in the first line, and the brigade of dragoons and light cavalry, in the second and third lines respectively. Each line immediately throws out ground scouts and combat patrols. The distance between the first and second lines is from 200 to 300 paces, and between first and third from 300 to 400 paces. The horse artillery is massed 150 paces in rear of the first line. The first line formed in line of masses with deploying intervals, or in line

of platoon columns, is the line of attack. Its commander selects his point of attack and manœuvers accordingly, deploying his squadrons as late as possible. He, as well as the commander of the second line, is allowed great liberty of action. The second line is the line of manœuver and generally marches in line of masses with deploying intervals, and is formed in line of columns as soon as the first line is deployed into line of battle, and remains always at a fixed distance from the first line. Its special role is to support the first line, and manœuver against the flank or rear of the enemy's second line. Its commander always retains some squadrons in hand. The third line, held as a reserve against every eventuality, keeps at a distance of about 450 paces in rear of the first, and is under the immediate orders of the division commander.

The fundamental principles of combat of the French cavalry are as follows: Against cavalry to always attack first, and anticipate the adversary in the charge; to surprise and take him in flank and rear; to support every front attack by a simultaneous flank attack.

Cavalry, as a rule, should never charge infantry, unless the latter be demoralized and wavering, in which case, it must endeavor to approach it under cover till within striking distance, and then attack with the greatest impetuosity, passing over the death zone as rapidly as possible. The attack is made in echelons, one following the other in rapid succession, so that the enemy will not have time to reform his broken lines.

In the attack against artillery one portion of the cavalry charges as foragers, overlapping both flanks of the enemy, whilst the remainder tries to turn the position and fall upon the supports.

Works used in the foregoing compilation:
Annuaire de la Cavalerie Francaise, 1885.
Revues de Cavalerie, 1887–'88.
Reglement sur les Exercises de la Cavalerie.
The Armed Strength of France.
The School of Application at Saumur, by Lieutenant S. C. ROBERTSON, 1st Cavalry.

CONSTITUTION AND BY-LAWS

OF THE

U. S. CAVALRY ASSOCIATION.

ARTICLE I.

TITLE.

This society shall be known as the "U. S. CAVALRY ASSOCIATION."

ARTICLE II.

HEADQUARTERS.

The headquarters shall be at Fort Leavenworth, Kansas.

ARTICLE III.

DESIGN.

The design of the Association is professional unity and improvement, and the advancement of the cavalry service generally.

ARTICLE IV.

MEMBERSHIP.

SECTION 1. The Association shall consist of regular, life, honorary and associate members.

SEC. 2. Cavalry officers and former officers of honorable record in that arm are entitled to become regular or life members, without ballot, upon their application and upon payment of dues.

SEC. 3. Honorary members shall be elected from men distinguished in military or naval service, not on the active list, and from eminent men of learning. Their number shall not exceed twenty. Nominations for honorary members shall be made to the Executive Council, and after favorable report by the Council, a vote equal to one-half the number of regular and life members, given by proxy or presence at an annual meeting, shall be cast, a majority electing.

SEC. 4. Any individual may be elected an associate or life member by a vote of the Executive Council, confirmed by a majority vote of the regular resident members of the Association.

SEC. 5. The prize essayist of each year shall be a life member without payment of fee.

SEC. 6. Associate members and those elected life members under Section 4 of this Article, shall be entitled to all the rights and privileges of the Association, including a share in its discussions, presentation of papers, etc., but shall not be entitled to vote or be eligible to office.

SEC. 7. Membership dates from the first day of the calendar year in which the application is made, unless said application is made after December 15th, when the membership dates from the first day of the next calendar year.

SEC. 8. The entrance fee shall be $2.00, payable upon joining the Association, and this shall be in lieu of annual dues for the first year's membership. The annual dues shall be $2.00, payable upon the first of each succeeding calendar year. The fee for life membership shall be $25.00.

SEC. 9. No member shall be dismissed, except on recommendation of the Executive Council, approved by a majority vote of the members of the Association, voting by proxy or presence, at any regular or called meeting, of which notice of at least one month shall be given. Members two years in arrears shall be dropped. When dropped for non-payment of dues they may regain their membership by paying two years' arrearage of dues, but the Executive Council may adjust any special case on its merits.

ARTICLE V.

GOVERNMENT.

SECTION 1. The officers shall be:

A President.

A Secretary, who shall also be Treasurer.

A Vice-President and a Corresponding Secretary for each branch.

SEC. 2. The permanent committees shall be:

An Executive Council, to consist of the President of the Association, the Secretary and Treasurer, and three members to be appointed by the President.

A Committee on Publication and Correspondence, consisting of two members appointed by the President, and the Secretary and Treasurer.

ARTICLE VI.

DUTIES.

SECTION 1. The President shall preside at the meetings of the Association or its branches at which he may be present, and generally shall perform such duties as pertain to the office.

SEC. 2. In the absence of the President the senior regular member present shall preside.

SEC. 3. The Secretary and Treasurer shall be *ex-officio* a member of the Executive Council and of the Publication and Correspondence Committee. He shall keep a journal of the proceedings of the Association, a separate re-

cord of the proceedings of the Executive Council, and a copy of the Constitution and By-Laws. He shall be generally the organ of the Association in matters of finance, business and correspondence. At each annual meeting he shall submit a detailed report of the business of the Association.

SEC. 4. The affairs of the Association shall be conducted by the Executive Council, which may make such regulations not inconsistent with the Constitution as may seem necessary. Three members of the Council shall constitute a quorum.

SEC. 5. The Committee on Publication and Correspondence shall have charge of the preparation of manuscript for publication, the transaction of all business connected with the printing, publishing, and editorial management of the Journal of the Association. It shall also be the duty of this committee to further the interests of the Association by correspondence, giving information of the objects and purposes of the Association, and distributing circulars, pamphlets, and such other publications of the Association as may be deemed advisable.

SEC. 6. The selection of papers for publication in each Journal shall be made from those read before the Association by a special committee appointed by the presiding officer. These committees will not be announced.

ARTICLE VII.

ELECTIONS.

The officers of the Association shall be elected at the annual meetings. A majority of votes cast by presence or proxy shall elect.

ARTICLE VIII.

BRANCHES.

SECTION 1. Branches of this Association may be established at any station where there are eight regular members. At a station where there is no branch, a Corresponding Secretary shall be appointed by the President, who shall attend to the business pertaining to the Association for that station.

SEC. 2. The officers of a branch shall be a Vice-President and a Corresponding Secretary.

SEC. 3. The Vice-President shall perform the same duty for the branch as prescribed for the President of the Association.

SEC. 4. The Corresponding Secretary of a branch shall keep a register of the members residing in his vicinity, and an account current with each. He shall keep a journal of the proceedings of the branch, and a copy of the Constitution and By-Laws. He shall give due notice of the meetings of his branch. He shall forward to the Secretary and Treasurer of the Association all papers read before his branch, and keep himself informed of all business relating to his branch. He shall receive and distribute publications. He shall collect dues from members of his branch and give receipts therefor. He shall be authorized to expend such part of the funds in his possession for stationery, postage and other incidental expenses as may be necessary. He shall, at the end of each quarter, render to the Secretary and Treasurer a detailed statement of moneys received and expended, and shall forward the

funds remaining on hand, retaining only sufficient to defray the estimated current expenses of the branch for the ensuing quarter.

SEC. 5. Monthly meetings of each branch may be held upon such dates as the branch may decide; but if there be no paper to be read or business to be transacted at the appointed date, the Corresponding Secretary may omit the call for the regular meeting. Special meetings may be called when necessary.

SEC. 6. Branches will make such By-Laws, not inconsistent with this Constitution, as may be deemed necessary for a proper transaction of business.

ARTICLE IX.

MEETINGS.

SECTION 1. An annual meeting shall be held at the headquarters of the Association, on the third Monday of January.

SEC. 2. The regular business meetings shall be held twice each month. Special meetings shall be called by the President and Secretary when desirable.

ARTICLE X.

PAPERS AND PROCEEDINGS.

SECTION 1. Whenever deemed advisable by the Executive Council, the papers read before the Association and its branches, together with the discussions growing out of the same, shall be published, and distributed free of expense to each regular, life, honorary and associate member, and to such libraries and periodicals as may be determined by the Committee on Publication and Correspondence.

ARTICLE XI.

ALTERATION OF THE CONSTITUTION.

SECTION 1. The Constitution may be added to or amended by a two-thirds vote of the regular members present or properly represented by proxy, at an annual meeting of the Association. Proposed alterations shall be furnished the Secretary in writing, signed by five or more members, not less than three months prior to the meeting at which they are to be acted upon. The Secretary, under the direction of the Executive Committee, shall publish such proposed alterations to the Association not less than sixty days prior to said meeting.

BY-LAWS.

SECTION 1. Cushing's manual shall, in so far as applicable, govern the parliamentary proceedings of the society.

SEC. 2. The regular meetings shall be held on the first and third Mondays of each month.

SEC. 3. The regular order of procedure shall be:

Reading the minutes of the previous meeting.
The reading of papers.
The discussion of papers.
Stated business.
Unfinished business.
Reports of committees.
Miscellaneous business.
New business.
Adjournment.

SEC. 4. When members discuss papers orally, in the absence of a stenographer, it is expected that they submit to the Publication Committee, in writing, what they consider to have been the substance of their remarks.

SEC. 5 A quorum for the transaction of business, other than the reading and discussion of papers, shall consist of a majority of the regular resident members.

SEC. 6. These By-Laws may be added to or amended at any meeting by a two-thirds vote of the regular resident members.

OFFICERS OF THE ASSOCIATION.

1888.

PRESIDENT.

BRIG. GEN'L W. MERRITT, BVT. MAJ. GEN'L U. S. A.

SECRETARY AND TREASURER.

FIRST LIEUT. O. L. HEIN, 1ST CAVALRY.

EXECUTIVE COUNCIL.

BRIG. GEN'L W. MERRITT, BVT. MAJ. GEN'L U. S. A.
MAJOR E. V. SUMNER, 5TH CAVALRY, BVT. LIEUT. COL. U. S. A.
CAPTAIN W. H. RAFFERTY, 6TH CAVALRY.
CAPTAIN C. C. C. CARR, 1ST CAVALRY.
FIRST LIEUT. O. L. HEIN, 1ST CAVALRY, SEC'Y AND TREAS. (*ex-officio.*)

COMMITTEE ON PUBLICATION AND CORRESPONDENCE.

CAPTAIN J. B. BABCOCK, 5TH CAVALRY, BVT. MAJ. U. S. A.
FIRST LIEUT. M. F. EGGLESTON, 10th CAVALRY.
FIRST LIEUT. O. L. HEIN, 1ST CAVALRY, SEC'Y AND TREAS. (*ex-officio.*)

BRANCHES:

WEST POINT, N. Y.

VICE-PRESIDENT,
FIRST LIEUT. G. B. DAVIS, 5TH CAVALRY.

CORRESPONDING SECRETARY,
FIRST LIEUT. W. C. BROWN, 1ST CAVALRY.

FORT RENO, INDIAN TERRITORY.

VICE-PRESIDENT,
COLONEL J. F. WADE, 5TH CAVALRY.

CORRESPONDING SECRETARY,
FIRST LIEUT. F. MICHLER, 5TH CAVALRY.

LIST OF MEMBERS.

HONORARY MEMBERS.

General W. T. SHERMAN, U. S. A.
Hon. J. C. ROPES.
Brig. Gen'l P. ST. GEORGE COOKE, U. S. A.
General LEW WALLACE.
Brig. Gen'l WM. S. HARNEY, U. S. A.
Governor FITZHUGH LEE.
Hon. JOSEPH WHEELER, M. C.

REGULAR, ASSOCIATE AND LIFE MEMBERS.

ALMY, W. L.....2d Lieut. 5th Cavalry
ALLEN, J.....1st Lieut. 3d Cavalry
ARNOLD, A. K.....Lieut. Col. 1st Cavalry
ANDRUS, E. P.....1st Lieut. 5th Cavalry
AUGUR, J.....Captain 5th Cavalry
BABCOCK, J. B., Capt. 5th Cav., Bvt. Maj. U. S. A.
BOUGHTON, D. H.....1st Lieut. 3d Cavalry
†BRECKENRIDGE, J. C.....Col. Ins. Gen'l
BLOCKSOM, A. P.....1st Lieut. 6th Cavalry
BLAKE, J. Y. F.....1st Lieut. 6th Cavalry
BROWN, W. C.....1st Lieut. 1st Cavalry
BROWN, O. J.....1st Lieut. 1st Cavalry
BEACH, F. H.....2d Lieut. 6th Cavalry
BRADEN, C.....1st Lieut. U. S. A.
BINGHAM, G. S.....2d Lieut. 9th Cavalry
BOMUS, P. S.....Capt. 1st Cavalry
BATES, A. E.....Major Pay Dep't
BAIRD, W.....1st Lieut. 6th Cavalry
BEACH, W. D.....1st Lieut. 3d Cavalry
BRYAN, R. B.....2d Lieut. 2d Cavalry
BROWN, A. H.....2d Lieut. 4th Cavalry
BACON, J. M.....Major 7th Cavalry
CARR, E. A., Col. 6th Cav., Bvt. Maj. Gen. U. S. A.
CARR, C. C. C.....Captain 1st Cavalry
CRAIG, L. A.....1st Lieut. 6th Cavalry
COOPER, C. L.....Captain 10th Cavalry
COONEY, M.....Captain 9th Cavalry
CLINCH, C. N.....2d Lieut. 3d Cavalry
CAMPBELL, L. E.....Captain Q. M. D.
CHEEVER, B. H.....1st Lieut. 6th Cavalry
CARROLL, H.....Major 1st Cavalry
CLARKE, P. H.....2d Lieut. 10th Cavalry
CAMERON, G. H.....2d Lieut. 7th Cavalry
CARSON, J. M.....2d Lieut. 5th Cavalry
COOLEY, JAMES C.....Late Capt. 5th Cavalry
DICKINSON, W. M.....1st Lieut. 4th Cavalry
DAVIS, G. B.....1st Lieut. 5th Cavalry
DORST, J. H.....Captain 4th Cavalry
†DIETZ, W. D.....1st Lieut. M. D.
DAY, M. W.....1st Lieut. 10th Cavalry
EGGLESTON, M. F.....1st Lieut. 10th Cavalry
ELLIS, E. A.....1st Lieut. 8th Cavalry
ELLIOTT, W. L., Col. and Bvt. Maj. Gen. U. S. A.
ELLIOTT, S. H.....2d Lieut. 5th Cavalry
EVANS, E. W.....2d Lieut. 8th Cavalry
FINLEY, L.....1st Lieut. 10th Cavalry
FINLEY, W. L.....1st Lieut. 9th Cavalry
FARBER, C. W.....2d Lieut. 8th Cavalry
FOUNTAIN, S. W.....1st Lieut. 8th Cavalry
FOLTZ, FRED. S.....1st Lieut. 1st Cavalry
FREEMAN, S. D.....2d Lieut. 10th Cavalry
FOSTER, F. W.....1st Lieut. 5th Cavalry
FULLER, E. B.....1st Lieut. 7th Cavalry
FORBUSH, W. C.....Captain 5th Cavalry
GARRARD, JOS.....1st Lieut. 9th Cavalry
GOLDMAN, J. H.....1st Lieut. 5th Cavalry
†GIBBS, GEO. W.....Capt. M. N. G.
HEIN, O. I.....1st Lieut. 1st Cavalry
HATCH, EDWARD, Col. 9th Cav. Bvt. Maj. Gen'l
HARRIS, M.....Captain 1st Cavalry
†HEIZMAN, C. L.....Major M. D.
HALL, W. P.....Captain 5th Cavalry
†HASBROUCK, H. C.....Major 4th Artillery
HUNTT, G. G.....Lt. Col. 10th Cavalry
HALL, T. W.....2d Lieut. 10th Cavalry
HAYES, E. M.....Captain 5th Cavalry
†HADEN, J. J.....1st Lieut. 8th Infantry
HENRY, GUY V., Maj. 9th Cav., Bvt. Col. U. S. A.
HOYLE, G. S.....1st Lieut. 1st Cavalry
HUNT, L. P.....1st Lieut. 10th Cavalry
HUGHES, M. B.....Captain 9th Cavalry
†HUGHES, W. N.....2d Lieut. 13th Infantry
†HOFF, J. VAN R.....Capt. M. D.
HAINES, J. T.....2d Lieut. 5th Cavalry

†Irons, J. A.....1st Lieut. 20th Infantry
Irwin, F. J.....2d Lieut. 2d Cavalry
Jones, T. W.....1st Lieut. 10th Cavalry
Johnson, J. B.....Captain 3d Cavalry
Jackson, J....Capt. 1st Cav., Bvt. Maj. U. S. A.
Johnson, C. P.....2d Lieut. 10th Cavalry
Johnston, J. A.....1st Lieut. 8th Cavalry
†Jarvis, N. S.....1st Lieut. M. D.
Jenkins, J. M..... 2d Lieut. 5th Cavalry
Keyes, A. S. B.....Captain 10th Cavalry
Koehler, L. M.....2d Lieut. 6th Cavalry
†Kelton, J. C.....Col. Asst. Adj. Gen'l
King, C.....Captain U. S. A.
Kendall, H. M.....Captain 6th Cavalry
†Koops, C.....2d Lieut. 13th Infantry
Kelly, J.....Captain 10th Cavalry
Kennedy, W. B.....Captain 10th Cavalry
Lawton, H. W..... Captain 4th Cavalry
Landis, J. F. R.....1st Lieut. 1st Cavalry
London, R.....1st Lieut. 5th Cavalry
†Lemay, D.....V. S.
Leoser, C. McK.....Late Capt. 2d Cavalry
†Martin, G. W.....2d Lieut. 18th Infantry
Mann, J. D.....2d Lieut. 7th Cavalry
Macdonald, G. H.....2d Lieut. 1st Cavalry
McDonald, J. B.....2d Lieut. 10th Cavalry
Moore, F.....Captain 9th Cavalry
†Murray, A.....1st Lieut. 1st Artillery
Murray, C. H.....1st Lieut. 4th Cavalry
Merritt, W., Brig. Gen., Bvt. Maj. Gen. U. S. A.
Macomb, A. C.....2d Lieut. 5th Cavalry
McClellan, H. B.....Major Ex C. S. Cavalry
†McIntyre, F.....2d Lieut. 19th Infantry
†McCook, A. McD.,
Col. 6th Inf., Bvt Maj. Gen'l U. S. A.
Mizner, J. K.....Lt. Col. 8th Cavalry
Moylan, M.....Captain 7th Cavalry
Michler, F.....1st Lieut. 5th Cavalry
*Martin, H. McLane.....——
Mills, A. L.....2d Lieut. 1st Cavalry
Mackay, J O.....1st Lieut. 3d Cavalry
Montgomery, R. H.....Captain 5th Cavalry
Munford, Thos. T....Gen'l Ex C. S. Cavalry
Nordstrom, C. E.....1st Lieut. 10th Cavalry
Norvell, S. T.....Captain 10th Cavalry
†Noyes, C. R.....1st Lieut. 9th Infantry
Olmstead, J. A.....Captain 9th Cavalry
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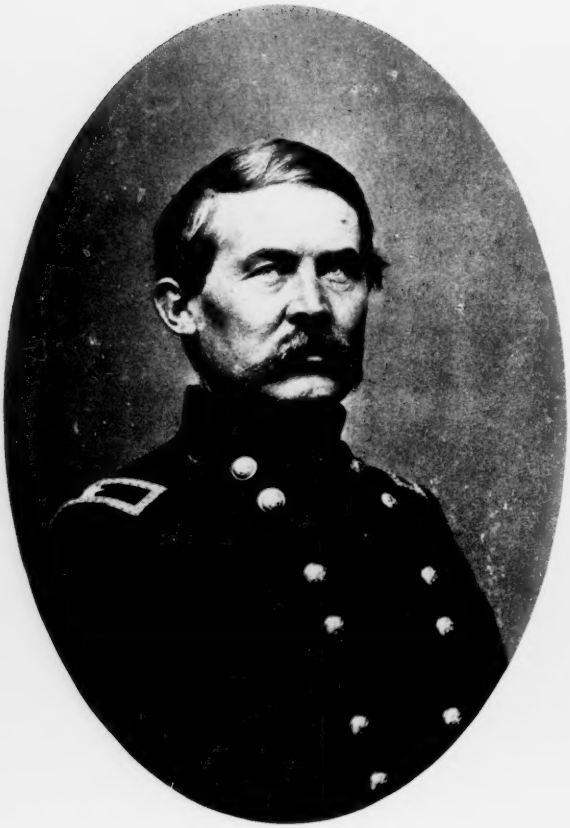
NOTE.—The absence of the French accents in the places where they should be, is due to a want of facilities on the part of the printer.